METHODS IN TEACHING

Edited by

J. J. TILLEY

AUTHORIZED BY THE

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FOR USE IN COUNTY MODEL SCHOOLS

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Methods in Teaching

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PREFACE.

At a meeting of the Training Department of the Ontario Education Association held last year, the Model School masters by resolution expressed a desire that a text book on Methods should be prepared for the use of teachers-in-training.

It was suggested that educators of well known ability in the teaching of particular subjects be asked to contribute, in order that the book might set forth the most approved modern methods of teaching, as developed by large experience.

This suggestion was adopted unanimously, and the undersigned was requested to make all necessary arrangements and to act as editor.

After much thought and consultation with those interested in the subject, the gentlemen whose names are given in the list of contributors, were requested to write on the several subjects allotted to them; and the editor desires to thank the contributors for the readiness with which they responded to his request, and to acknowledge their claim to the greater share of whatever credit may be awarded to this publication.

Although the nature and scope of the work undertaken by the different writers were discussed and outlined when the subjects were assigned, yet each contributor is to be considered as mainly responsible for his portion of the work.

The editor wishes to acknowledge his indebtedness to Mr. J. Russell Stuart, Inspector of Public Schools for the City of Stratford; to Dr. Waugh, Principal of the Collegiate Institute, Whitby, and to Mr. J. Suddaby, Principal of the Model School, Berlin, for valuable assistance in the preparation of his chapter on "Analysis of Method."

This text book is intended to serve merely as an assistant. The teacher should not allow it to become a substitute for his own individuality, or to lead him to relax his efforts in devising new methods for himself. The book is for the teacher, not the teacher for the book. One cannot accomplish the best results with the method of another, however excellent it may be, until he has thoroughly assimilated it and made it his own.

How far the contributors have succeeded in their efforts remains for teachers to determine, but the book is submitted in the hope that the main purpose, viz.: The lessening of the arduous labors of Model School masters, will, to some extent be effected, and also that those who are not engaged in the professional training of teachers may receive some help from its pages.

J. J. TILLEY, *Editor.*

TORONTO, *January, 1899.*

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METHODS IN TEACHING

CHAPTER I

ANALYSIS OF METHOD.

This book is not intended to teach Psychology, but as methods of teaching should be in harmony with the fundamental principles of education it will be necessary to consider some of the truths made known by this science.

The mental processes by which knowledge is acquired are discussed in three divisions, yet it must not be assumed because they are considered separately, for convenience, that they are always distinct or separate in action — that one ends before another begins.

A.

Our experiences of the world around us furnish a starting-point for every form of mental activity. These experiences can be secured only through the medium of the senses. Without these the mind would be left entirely to itself, and its activity could not be conceived of. As Dr. McLellan says:—"It is impossible to have knowledge where there has been no basis in presentation." (Applied Psychology, p. 15).

Mental life involves infinitely more than this, but its initial point of activity must be consciousness of stimulation of the sense-organs from without. The

first stages of knowledge must be based upon and determined by the realities which constitute environment. The abstract can never precede the concrete.

Although necessarily involved in what has been said, it may be expressed in a separate statement, that words of themselves do not convey ideas. The idea must be gained from the object of thought before the word or symbol can have any significance ; for "names do not inhere in things." It was the observance of this law that especially characterized the teaching of Pestalozzi and of Froebel. They first supplied the conditions of experience to the child, and then directed his knowledge and his activities in accordance therewith.

The means by which human cultivation must begin is tersely expressed in the following quotation from Hinsdale:—"A man blind from birth may learn the whole color vocabulary, but he can have no conception of its meaning. The appropriate sense must always furnish a starting point from which the mind may work. Similarly language, writing and pictures can never take the place of a suitable grounding in the primal realities of sense and of the spirit. No human being's cultivation ever began with words of wisdom. The library is a sealed book save to him who already possesses the keys of knowledge. A volume is first a thing, then a book. The command to keep out of the fire is significant only to those persons who have already learned by experience what the fire is. In this primal sense, therefore, the education of all men starts at the same place, and proceeds by the same steps." (Studies in Education, p. 31).

It necessarily follows from these facts that a

rational system of teaching must begin with the presentation of external realities.

This method of teaching is known as the objective method, and as it must furnish the basis for all subsequent knowledge it should be understood in its broadest sense. Any failure to grasp the extent of its application will reveal itself but too plainly in the limitation of its use. The teaching of "object-lessons," in which the realities are usually things which can be seen and handled, has tended to restrict objective teaching to the presentation of visible things, or to what is usually understood by the term "objects." It should however be understood in a much broader sense. Although it will be further explained in subsequent paragraphs, it may be defined as teaching through examples of the thing to be learned, or more briefly, as teaching anything through itself. It includes the teaching of everything which is to be learned through the senses. When a child hears any sound for the first time, or becomes conscious of the taste of an object, or by touching an object learns of its smoothness, roughness, etc., or when he learns sharpness by cutting himself with a knife, or heat by burning himself, he is being taught objectively quite as truly as when the teacher shows him what coal is by placing a piece of coal in his hand.

It is however to the extension of this method to the teaching of actions that attention should be especially called, because the advantage of its application in this connexion is not recognized sufficiently by many teachers. An action is an objective reality quite as much as is a tangible object, and it should be taught in the same way. We teach a child what a

skate is by showing him the object skate, and in the same way he should learn what skating is, that is by seeing the action of skating performed. It is of the highest importance that this rule should be observed in the teaching of arithmetic. What has been said of words not conveying ideas, applies with equal force to symbols of operations to be performed. The latter are as meaningless to the child as are the former until the actions which they indicate have been performed before the child, or by the child, and the meaning of the symbol grasped by the mind. $4+4=8$ may be learned in its symbol form but the expression has no meaning for the child until he has taken two groups of four things of the same kind and has noted the result after having placed them together. The expression is in no sense concrete except when considered as a symbol, and can at first be of no more service for thought-getting than can the word red be to one who has never seen that color.

Pupils who have learned the multiplication-table "by heart," and who can work figure exercises rapidly and correctly, too often have but a vague idea of what is meant by multiplication. If asked to show by means of splints, or dots on their slates what they understand $6 \times 4 = 24$ to mean, probably not one in five will satisfy us that he has grasped the meaning of the expression.

It is not contended that the child should dwell too long upon the concrete, but he should be taught in this way until he understands the operations, and frequent exercises with the concrete serve as the best possible test of his knowledge. When giving simple problems to junior classes one or more type-problems

should be taught objectively preparatory to the use of figures. Each child should be required, and assisted if necessary, to perform the operations with splints or other small objects; then with the objects before the eye, and the operations fresh in the memory, the corresponding figures and the symbols of operation when placed upon the blackboard will have a real meaning for the pupils.

It is not enough merely to *illustrate* with objects. The operations should be performed by the pupils again and again until the problem is thoroughly understood.

A pupil may manipulate the figures quite readily and yet have scarcely any idea of what is involved. The true test of knowledge in all such cases is the ability to do, and the best way to assist the child in this connexion is not to call his attention to figures on the board, or to give verbal explanations, but to lead him to examine his own work, and thus to correct his error if necessary. As a means of broadening the pupil's conception of the solution of a problem, and of affording him the pleasure which always springs from the acquisition of knowledge and from the consciousness of power, the teacher may point to the indicated operations as shown upon the board and require pupils to take the necessary steps with the splints, or he may perform the operations and let the pupils point out or make the corresponding figures or symbols of operation upon the board. Such an exercise is always enjoyed by pupils.

It will be better to devote the whole time of a single lesson to the thorough mastery in this way of one type-problem than to allow the pupils to solve a

dozen questions by means of verbal explanations and imitation of the teacher's blackboard work.

This method of teaching is especially useful and should always be practised in giving pupils their first lessons in the compound quantities which are used, and in the operations which are to be performed in what are commonly known as Reduction and the Compound Rules. These are fully discussed in the chapter on Arithmetic. No learning of the "tables" from a book, and no subsequent working of an indefinite number of examples with figures can ever serve as a substitute for a thorough "grounding in the primal realities" of quantity and of operation.

There is another branch of education which comes as fully within the purview of the objective method as either of these already mentioned. It is the teaching of ethics, which is but the science of human action. The child's first idea of what is right and of what is wrong must be obtained as the beginnings of all other knowledge are obtained, that is from the concrete, from realities. The concrete in this case is action. It is the child's own acts in relation to those in authority over him. He gets his first conception of right from what he is permitted to do, and of wrong from what is prohibited.

The child learns authority, government, restraint, self-denial, obedience, etc., just as he learns the qualities of objects. He learns them as objective facts or realities. The little child will never learn the meaning of truthfulness, kindness, gentleness, sympathy, patience, through the use of words; he must be taught through the illustration of these qualities

in action. "Moral knowledge and natural knowledge originate in the same way."[1] And teachers of experience know that better results are achieved in the schoolroom by the observance of this fundamental principle than by trusting to formulated precepts as rules of conduct, however excellent these may be.

The force of a moral quality can be readily grasped when it is individualized in action, and actions which touch the person are more effective in influence than those which appeal only to the understanding. Justice when administered by the teacher in the schoolroom and on the play-ground becomes a living reality "known and read of all men." The heart is the true schoolroom, through which deeds of kindness, of sympathy, and of love come home to the mind. For the teaching of those moral qualities which underlie a worthy character, no special provision need be made in the time-table. Given the earnest, devoted teacher, in whose heart these qualities abound, and the necessary objective teaching will be co-existent with the contact between teacher and pupil. If these qualities are not possessed by the teacher, no constructed curriculum can serve as a substitute therefor.

It was in this connexion that Emerson said:—"I care but little what my daughter learns, I care much from *whom* she learns;" and it was this truth, illustrated in private life which enabled Sir Richard Steele to say of Lady Hastings:—"To meet her was an immediate restraint upon all improper conduct and to be acquainted with her was a liberal education."

Such teaching will be assisted by the proper

1 Hinsdale.

consideration of illustrations of human action furnished in history[1] and in literature.

The relations of men to each other give rise to morals, and as history sets forth these relations, one of its chief uses is to form moral notions in children. Men are object lessons in moral education. Their deeds live after them to inspire and to warn. History abounds in examples of courage, patriotism, devotion to duty, nobility of character, in short of all the higher qualities which ennoble mankind. When these are properly considered, with the many painful contrasts found on the pages of history, the mind is led to form judgments thereon, which will have a reflex influence on the character of the person forming them.

McMurray, in illustrating this point, says:— "When Sir Philip Sidney, wounded on the battlefield, and suffering with thirst, reached out his hand for the cup of water that was brought, his glance fell upon a dying soldier, who viewed the cup with great desire. Sidney handed him the water, with the words, 'Thy necessities are greater than mine.'" No one can refuse his approval of this act.

After telling the story of the man who went down to Jericho and fell among thieves, and then of the priest, the Levite and the Samaritan who passed that way, our Lord put the question to His critics, "Who was neighbor to him that fell among thieves?" And the answer came from unwilling lips, "He that showed mercy." Such moral judgments as these

1 The relation of history to ethics should be discussed in the second part of this chapter, but on account of its close connexion with what has just been said, it is considered here.

spring up naturally and surely, when we understand the circumstances under which an act was performed. On the other hand, it is natural to condemn wrong deeds when presented clearly and objectively in the action of another, and later, the judgment must react upon our own conduct."

The following quotation from De Garmo[1] furnishes a very fitting conclusion for the discussion of this part of our subject:—"All ethical instruction should proceed from individual cases of action involving a moral content. Hence it does not suffice to preach in school, except from the text of an actual event. Children can best get the first points of crystallization for moral truths from stories involving a moral content. History fulfils its noblest mission to the race on account of its ethical content, and of the individual nature of the presentation. Every deed of heroism, of benevolence, of charity, of patriotism, is a concrete embodiment of a precious virtue; while every mean, cowardly, dastardly act is an individual protest against meanness, cowardice, villainy. We can only continue the deposit about these starting points, until at last the soul is strong enough in itself to stand alone."

B.

We have seen that all knowledge must begin with individual notions acquired objectively through contact of the sense-organs with external phenomena. We have now to consider how this knowledge is extended. These individual notions are not stored

1 "Essentials of Method," p. 65.

away in the mind as "dead treasures," but through them the mind is enabled to take in new perceptions more readily, and to extend them. The senses furnish these materials, while representation, imagination and judgment co-ordinate and assimilate them. New perceptions are referred to the old, and are interpreted and mastered through our former experiences. In this way "old thought becomes material for new thought."

We thus get at the core of apperception or the assimilation of knowledge, which is that we learn through what we have. De Garmo defines it as:—"The condition of understanding through the subsumption of new subjects under old predicates." (Essentials of Method, page 31). Lange says:—"With the aid of familiar perceptions, the child appropriates that which is foreign to him and conquers with the arms of apperception the outer world which assails his senses;" and again, "One has no eye, no ear, no receptivity, no understanding for that for which one has no related thought, no connecting points, no rich store of related concepts."

We shall next consider the use of words in relation to apperception.

When primal realities become subjects of consciousness, through the senses, they constitute our personal experiences, and when words or symbols are associated with these experiences, they serve as storehouses of thought. And when these words are again presented to the eye or to the ear, the mind through memory calls up into conscious concepts the experiences with which the words were first associated. These serve as apperceptive centres, and

through the constructive power of imagination the mind re-arranges and transforms them into new forms and combinations in harmony with the way in which the words are presented to it.

The following illustration will serve to show how this is done. I meet a child who has seen only a small wooden church building, and I endeavor to give him a mental picture of a church which I have seen. As soon as I use the word church he calls up the image of the church which he has seen. I tell him that my church was high and large, and at once through his imagination he sees his church raised and extended in size. I tell him my church was made of brick and that it had a bell placed above the roof. He immediately sees his church surrounded with brick, and a bell placed above it as described. Thus out of his stock of concepts or personal experiences the child has constructed for himself an image of the church which I described, in accordance with the words presented to him.

It must be carefully noted that all the concepts out of which the child constructed his image of my church were previously in his mind. If he had had no concept related to the word brick his church would have remained wooden, and if he had never seen a bell his church would have been unsupplied.

Imagination can *con-struct,* that is *build together,* but it cannot create original elements. These, as has been shown in part A, must be furnished to the mind through the appropriate sense. The imagination can form compounds and combinations which never existed before, and in this sense may be said to

create, but in every case its creation is restricted to elements that are already in the mind.

The work of imagination may be illustrated by that of the blacksmith. He takes separate pieces of iron, and after heating, welds them together. He creates the horse-shoe, but he does not create the pieces of iron out of which it is made.

By this explanation the student will grasp more fully the meaning of the statement previously made, that words do not convey ideas. This may now be better stated by saying that words do not create ideas. The spoken word is but a sound, just as the written word or symbol is but a drawing or picture. Before either can become speech, it must, as has been said, when recognized, call up and be associated with some concept already in stock, by means of which the mind can interpret to its own consciousness what the speaker or writer desires to express through the word. It is only in this way that "the word can become a living force instead of a dead form." We are accustomed to say, "Ideas first, words next." *Realities before symbols* would express the same rule in a much broader way.

This method of teaching may be called the constructive method, and in view of what it involves teachers should endeavor to find out what concepts are possessed by the child before they attempt to make use of it.

The importance of the work recently undertaken by Dr. Stanley Hall and others, of leading teachers in a systematic manner to take stock of children's mental outfit before they begin to build thereon, cannot be overestimated. Failure to do this too often

causes much loss of labor and painful confusion of thought. To define the boundaries of a piece of land there must be a point of beginning, and unless we begin at the child's starting point of knowledge we cannot teach him intelligently. When we realize this we can understand why it is that what are apparently absurd answers are often given to questions in literature and other subjects by naturally intelligent pupils. The cause of this in many cases is that the pupils have no concepts by which they can interpret the words as they stand in their new relations, and in their desire to answer they rush to concepts with which the words have been associated in other relations, and as a result of their natural effort they are too often called or considered stupid. If they have not material in store out of which the mind can construct the necessary concept the question cannot be answered.

A little boy travelling in Europe was told by his mother that he was then in Switzerland, and was asked how he liked the appearance of it. He looked eagerly out of the window and replied, "I thought it was pinker than it is." The little fellow had evidently learned something from a wall map of Europe, in which pink had been used to represent Switzerland, and without any conception of the use of the word Switzerland, he had simply associated the sound of the word as used by the teacher with the color pointed out on the map. Hence from what he had learned though his eye and his ear, his answer was a perfectly natural one. If all the geographical concepts formed by pupils from the study of this subject from books could be fully exposed to view

we should find that many of them were equally absurd. A teacher endeavored to explain to his class how springs were formed by showing a section of a hill with the little streams percolating through the soil to the reservoir below, and after this had been done, and the effect of pressure explained, he asked if any member of the class had ever seen a spring. His feelings may be better imagined than described as one of his pupils at once replied, "Please our buggy's got two springs."

One of the many unavoidable difficulties with which teachers have to contend is the use of the same books for children who have been surrounded by very different environments, and who have, in consequence, acquired stocks of concepts that are quite dissimilar. Bryant's description of the prairies, for example, will "convey" but a feeble picture to the child who has always lived in a city. The meaning of "Dark hollows seem to glide along and chase the sunny ridges," cannot be grasped in its fulness by one who has never seen the sunshine and shadow chasing each other over the meadow, or rushing in quick succession along the surface of a field of waving grain.

In teaching by what we have called the Constructive Method, two things are especially necessary:—

(1) Such a review of the *known* as will prepare the mind for the apperception of what is to be learned; and,

(2) A skilful rearrangement of the new matter whenever this is possible, in order that the learner may be enabled to detect the relation between the old and the new.

It must not be assumed because the child has already in his mind the necessary predicates that he will, through them, interpret the new subjects. Experience proves that such is not usually the case. The child is more likely at first to regard each new thing to be learned as a distinct entity than he is to call up a related concept, and to associate with it the new subject of thought.

Pupils who have learned reduction of whole numbers will see "Reduction of Fractions" printed at the head of the page, and under the various rules given will work all the exercises without perceiving that the solutions are but new applications of what they have already learned.

A pupil may have learned that the product of the sum and difference of two quantities is equal to the difference of the squares of the quantities and he may know at once that $(a+b)(a-b)=a^2-b^2$, yet he will probably require some assistance at first to see that $(a-b+c-d)(a-b-c+d)=(a-b)^2-(c-d)^2$.

In preparing the mind for the new knowledge, the teacher "who sees the end from the beginning," will lead the child to note the point or points in the old through which the relation with the new is to be established.

For example, when a child learns that a *simple* word means *one* word, and that a *compound* word means two or more words taken together, he has the key by which the use of these words in many other connexions may be understood. The relation between a simple sentence and a compound sentence, between simple addition and compound addition, between simple interest and compound interest, etc., will be

readily seen when taught through the idea of unity and of plurality as found in the primal use of the words simple and compound.

The teaching of the "compound rules" will furnish excellent examples of what has been said about "rearrangement of new matter." The new points in these rules which will of course present difficulties to the learner are, (1) the separation of the columns by dots, (2) the names placed above the columns, and (3) the different ratios between the quantities the names of which are given.

The first and second difficulties may be easily removed and a question in the simple rules made to resemble one in the compound rules, and although the terms units, tens, etc., do not correspond to the names of applicate numbers, this fact will not trouble or mislead the pupil at this stage. In preparing for the use of ratios which are not common, a question in simple addition may be treated first as having other ratios than 10 which are common to all the columns, as 9, 8, 7, etc., and then as having different ratios between the columns. In this way the pupil is trained to work questions in the simple rules as if they were in the compound rules and the relation between the old and the new is easily seen.

Nearly every operation and every new term in fractions can be taught through something that has previously been learned by the pupil. $2\frac{3}{4}$ can be easily reduced to fourths when it is expressed as 2 units 3 fourths, and referred to the reduction of 2 bus. 3 pecks, to pecks. The value of a denominate fraction as $\frac{3}{5}$ yd. can readily be found when the

example is treated as an ordinary question in compound division—5 | 3 yds. 0 ft. 0 in. In changing a proper fraction to its corresponding decimal the pupil should not be told to "add a cipher to the numerator," but he should be taken back to simple division, which we assume was done when compound division was taught, and led again to see what act of reduction was really performed in the expression $235 \div 6$ before he could say "6 into 23" and again "6 into 55."

In such preparatory exercises the teacher must direct, and if necessary assist in changing the form of the question; but in every case the work should be done by the pupils, and if they are unable to solve the new problem it is because the preparatory steps have not been thoroughly understood, and these should be reviewed.

The young teacher may think that this method requires too much time, but experience will convince him that time is an essential element in all good teaching, and that the pupil's future progress will be commensurate with the thoroughness with which fundamental principles are mastered.

This method should be employed, wherever possible, in all subjects. The pronoun should be taught through the noun, the adjective phrase and clause through the adjective, the mountain through the hill, the river through the stream, the country through the school section, etc.

Points of dissimilarity and contrast will also assist the mind to grasp new truths and to retain them by the association of ideas. The difference between the preposition and the conjunction, between the

compound sentence and the complex, between the problem and the theorem, between the root and the power, between the causes and effects of great events in history, etc., will all become valuable aids in teaching when they are properly compared and distinguished.

This subject might be extended indefinitely, but it is hoped that what has been said will emphasize the importance of teaching subjects in their unity, and will assist teachers in working towards this end.

C.

As has been said, the mind must begin with individual or particular notions. The brute advances thus far. The horse, for instance, has the notions *road, hay, dog;* but these, like the earliest notions of the infant mind, must be very vague and indistinct. The mind of man is further endowed with the power of reflection through which it forms concepts.[1] Known objects are examined and compared, and their differences and likenesses discerned, and the mind forms general notions to represent objects having common characteristics, and groups the objects under these to form classes. It discerns the qualities and relations of things and affirms these as facts. From the knowledge of particular facts derived either from observation, or from testimony interpreted by our personal experience, the mind is able by the power

1 As concepts and the generalizations of inductive reasoning are somewhat similar, they are discussed in the same section, though the former might very properly have been considered at the beginning of Section B.

of inference to soar beyond the limits of past experience and to conceive those universal truths and laws which explain particular facts by revealing their true relations, and thus to organize and extend knowledge. The degree of intelligence to which any one attains is determined chiefly by the strength of this power to see the general in the particular, by ready and accurate insight to grasp the true relations of facts, to distinguish the essential from the non-essential, and thus to infer correctly the underlying principles. The generalizations of the child are crude and inaccurate; those of science clear and definite. It is the chief business of the teacher to train his pupils into the power and the habit of passing easily from the particular to the general. So far as the work of the teacher contributes to this training, it can be secured only by the practice of right methods of study. To cram the pupil's mind with particular notions with no regard to their true relations, or to require or permit him to memorize ready-made definitions of general truths, is not educating him. Principles and truths cannot be implanted in the pupil's mind by imposing upon him the memorization of empty forms of words, mere husks, which to him have never had any content. They can be developed only by the self activity of the pupil's mind, called forth, as has been shown in Section A, by the suitable presentation of appropriate objects, and stimulated and guided by the questions and directions of the teacher. The teacher who desires to be an educator cannot neglect the study of those processes of thought which produce the concept, principle or law.

The simplest general notion is that which represents a class of objects. This concept represents the characteristics which are common to all the objects of a class. Each general notion necessarily implies individual notions from which it is derived, and which are subsumed under it. The process by which this concept is formed can best be shown by the study of a particular instance.

The child perceives an apple, forming by a synthesis of the several perceptive acts through the different senses a sense percept or image of the object. He perceives a second apple and forms an image of it, and so on. When the second or succeeding images are formed, the mind, at first dimly, but with increasing clearness, compares the image with those which preceded it, and which are more or less fully recalled. It analyses and compares these images and perceives the common parts and properties, such as the characteristic shape, coloring, formation of parts, etc. It then abstracts these characteristics, or conceives them apart from any particular apple in which they are exhibited. All the common characteristics are then combined into a new thought-whole, a general notion of this kind of fruit. This concept contains only those characteristics which are common to all the members of the class; that is, only the parts and properties necessary to make it an apple. It cannot be imaged because it does not contain the individual peculiarities of shape, color, proportion of parts or flavor of this or that apple. The mind can express it only by a definition.

A large part of elementary teaching consists in aiding the pupil in the acquisition of new class

concepts, and it is important that the method of conducting lessons of this kind be considered somewhat in detail.

A primary condition of the lesson is evidently the presentation of examples of the objects to be classified. Who should give these examples, the teacher or the pupil? Some teachers assume that the pupil should furnish the examples, on the ground that he can better understand the objects which he himself discovers, and also that these are more likely to arouse his interest. An important objection in many instances is that it is a serious waste of time; the teacher can promptly and judiciously select examples suited to the child's development, and can ascertain by a question or two whether any are beyond his experience. Other objections are that it tends to discourage the pupil through the rejection of his efforts, and that it develops indefiniteness of thought, and a vicious habit of guessing. It is also illogical, presupposing a knowledge of the thing to be taught.

It forms no highly colored scene to picture a teacher who misapplies the perfectly sound rule, "that the teacher should not do for the child what he can do for himself," conducting a lesson in this fashion. His aim, let us say, is to teach the adjective, and he proceeds to "develop" examples. Holding up a piece of chalk he asks:—

T.—What is this?

P.—That is a piece of chalk.

T.—Tell me something about it.

P.—You can write with chalk.

T.—Yes. Now Mary you tell me something about it.

P.—The chalk was in the box.

T.—Y-e-s. But tell me something else about it.

Is it any wonder if after such an exercise both teacher and pupil are soon in despair and mentally groping in a fog.

The second step—the first for the child—is the examination of the examples presented. Here great care must be taken to direct the pupil's attention without suggesting that which he should discover for himself.

Having carefully examined the objects presented, the pupils are then guided by the teacher to make a comparison of their characteristics, stress being laid first upon those which are common. Examples should be multiplied, and the examination and comparison repeated with patience and thoroughness in order that the new concept may be clearly developed. It is a serious error to try to obtain the definition before the pupil, by the careful scrutiny of many examples, has firmly grasped the new notion. The impatient teacher is apt to suggest to the pupils by the form of his questions the wording of the definition and to accept the pupil's repetition of the borrowed language as proof that he has acquired the new notion.

When, as a result of the careful analysis and comparison of a sufficient number of examples, the new idea defines itself in the child's mind, he will be able to give expression to his thought. The new term which designates the class may now be given, any necessary improvements in the child's form of expression added, and the new definition made still clearer by being applied to new cases.

To illustrate the method suggested, let us take the teaching of the definition of an island. The best presentation for this lesson is, of course, examples of real islands as observed in a neighboring lake or stream. The concept may, however, be clearly and correctly developed, though with greater difficulty, by representing islands on the moulding board or on the blackboard. Having first aided the pupil's imagination by referring to local examples of land and water surfaces, to accept the surface of the moulding board as representing water, and the little heaps of sand as land, his attention is directed to the first example. To make vivid the image which his moulding board represents, the little fellow may in imagination row round the island, the course being traced on the moulding board back to the place of starting. The pupil then describes what he has observed. "This is land. This is water. The water is all round the land." As he scrutinizes a second example, he is certain to make some vague comparison with the first. Each succeeding example which the teacher directs him to examine, calls up the others, and finally by a systematic review the teacher makes the comparison formal and exact. The pupil sums up the results of his examination and comparison. "All these (pointing to the different representations) are pieces of land. This is water. The water is all round each piece of land."

The result of the comparison is that the child abstracts the notion of this relation of land and water; that is, there is formed in his mind a general notion of portions of land entirely surrounded by water, without connecting it with any particular

sland. He is now ready for the term *island*, which designates his newly acquired concept, and under the guidance of the teacher he makes a formal definition.

Having first directed the pupil's mind to discern the essential common characteristics, his notion may be more clearly defined by directing his attention to the non-essential or accidental features or qualities exhibited in individual examples, such as varying size, elevation, outline, or material. He observes or images some as mere patches of bare sand or rock, some sustaining forests, farms, and towns, or forming extensive countries. He perceives that some of these characteristics are common to several or to many examples, but he is led to see their non-essential character, and thus his concept of an island grows in extent and its essential characteristics are more clearly defined.

Having dealt with a typical example of conceptive thought or classification, we have next to investigate the method of forming a general truth, rule or law. Take as an example of this the general rule for forming the plural of nouns. Here again the pupil must begin with examples of the particular cases coming under the law. The teacher writes on the blackboard a list of familiar names of objects. As each is written he obtains from the pupil the statement that the name designates one thing of its kind. The pupil may also give the form which designates more than one.

Pen. Pens.

Book. Books.

Cup. Cups, etc.

Directed by the teacher's questions, the pupil

analyses this presentation and compares the words. He notes the different forms for each word, and the corresponding difference in their meaning. The several judgments expressing his thinking are somewhat as follows:—*Pen* denotes one thing. *Pens* denotes more than one thing. *Pens* is formed from *pen* by the addition of *s*. In a similar way he pronounces upon the relations of *book* and *books*, *cup* and *cups*, and all the other examples placed before him. As a result of his comparison of the words *pen*, *book*, *cup*, etc., he forms an abstract notion of a name with a singular meaning. He thus conceives a class of names meaning one, which he is taught to call names of the singular number. In the same way he forms a class concept of names of the plural number. By further comparison he discerns that the plural forms, *pens*, *books*, *cups*, etc., are formed by adding *s* to the singular names *pen*, *book*, *cup*, etc., respectively. As examples are multiplied, with increasing clearness is formed the thought, that, since all the names examined form their plurals by the addition of *s* to the singular, it must be true that *all* names form their plurals thus. This is necessarily beyond his experience, but the thought develops in his mind from its inherent tendency to attribute to *all* the members of a class, what has been observed to be true of those which have been examined. Subsequent experience teaches him the necessary modifications and limitations of the grammatical rule which he has thus discovered.

The act of thinking, by which the mind thus reaches beyond the limits of experience, is called Inductive Reasoning. It is through the operation of

this form of reason that all general truths, maxims, rules, and laws are developed in the mind. In cases of induction like that just described, the general rule is the mental product resulting from the examination and comparison of many examples. The more numerous these are, the greater the confidence in the rule.

Having now briefly considered the method of proceeding from the particular to the general, we have next to deal with the application of the general rule or principle to particular cases. By this exercise the pupil obtains a clearer apprehension of the truth, discovers new and perhaps unexpected applications, as well as limitations or exceptions. Above all he is practised in the exercise of formal reasoning.

Formerly it was the practice of many teachers, and of the text-book which they followed, to begin the presentation of the subject with a statement of general facts and principles. Thus a text-book on Grammar began with a definition of the subject, followed by definitions of its several divisions, and so on. The order of development followed was first the rule and then the examples subsumed under it. The elementary text-book differed from the more advanced only in being a thinner book, and in containing fewer particulars.

However suitable this plan of unfolding a subject may be for advanced students, who have already much elementry knowledge which enables them to attach at least some meaning to the definition given, it is not likely to be helpful in the teaching of children whose knowledge is meagre and ill-defined.

Training in inductive reasoning is of great importance not only as the logical preparation for the

deductive treatment of the more advanced portions of the subject, but also as a preparation for the practical affairs of life. People usually arrive at right conclusions when their beliefs or principles are right. It is a characteristic of the ignorant or careless, especially when swayed by passion, to generalize from an insufficient basis of facts, and thus to be influenced in their conduct by wrong opinions. The trained thinker learns to withhold judgement until the facts are closely studied, when a valid inference may be made.

The general rules or truths discovered by the pupil from a careful study of observed instances will not, however, be fully apprehended or retained by the memory unless they are applied to a sufficient number of new cases. In each instance of such application of a general rule or law, the pupil's thinking, when formally expressed, may be set forth in three related propositions, together constituting what is called the syllogism. For example, the pupil's answer, "John is a name; therefore, it is a noun" implies a succession of related thoughts which when fully expressed take this form:

Words used as names are nouns.

John is a name.

Therefore John is a noun.

The first or general statement is called the *major premise*, the second the *minor premise*, and the third, resulting from a comparison of the first two, is called the inference or conclusion. Frequently one of the premises, usually the major, is not formally expressed. In the above example, for instance, the pupil has assumed the definition of the noun, which forms the major premise. It helps greatly, however,

to a clear apprehension of the character of the thinking performed to give it full expression in the form of the syllogism. As an instance, take the correction of the example of false syntax, "John and me went to the fair." The lesson may proceed thus:—

T.—What error is here?

P.—*Me* should be *I*.

T.—Why?

P.—Because I is in the nominative case.

T.—Why should you use the nominative form?

P.—Because the subject of a finite verb is put in the nominative case.

Re-arranged in logical order, the pupil's statements are:—

Major.—The subject of a finite verb is put in the nominative case.

Minor.—*Me* is the subject of the finite verb *went*.

Inference.—*Me* should be changed to the nominative form *I*.

The teacher's persistent "Why" coming after the pupil has stated his conclusion, requires him to re-think his premises with greater precision, thus giving him a clearer grasp of their relations. Practice of this kind in logical thinking develops the pupil's reasoning power, and also gives him the habit of analysing the facts which form the basis of his inference. The proper method of teaching must be in accord with the logical order of thought. First, induction proceeding from the particular to the general, and then deduction proceeding from the general to the particular, is the unvarying and necessary sequence. The mind first grasps individual notions, then in succession are formed generalizations

more and more comprehensive. Each truth thus established is then applied to particular cases, thus storing the pupil's mind with new but properly related ideas. New concepts are clearly grasped by being assimilated to that which was previously known, and the pupil is trained into the habit of dealing with new subjects whether presented in books or in the affairs of life, in a logical way. He calmly examines, compares and infers. "He is taught to rise from the particular to the general as easily as to decend from the general to the particular again."

CHAPTER II.

THE TEACHING OF LITERATURE.

Scope of the term Literature as employed in connection with the Readers—The term Literature, although perhaps the best that can be found, is at once too narrow and too wide to indicate accurately the sort of work intended to be included in the teaching of Readers in Public Schools. It is too narrow because some of the instruction given in this connection is rather scientific than literary; it is too wide because a great deal of what is most naturally suggested by the term Literature is beyond the comprehension and experience of school-boys and school-girls. With regard to the first point: many of the selections in the Readers are manifestly not designed to introduce pupils to literature in its more proper sense, *i.e.*, to written thought which is marked by some special beauty and power, of form and expression; they are inserted for the sake of the information conveyed, in order to broaden the child's knowledge and to stimulate his interest in the world at large. They furnish an introduction and preparation for that important part of the reading of later years, which is motived, not by the desire of æsthetic enjoyment, of gratifying the literary instinct proper, but by the appetite for knowledge, by sympathy with mankind, and by curiosity in regard to the history of the race

and of the universe. Such lessons are the initial stage of scientific rather than of literary work. But since for ordinary people, knowledge must be acquired, in a great measure, not first-hand from things in themselves, but from books, the stimulation of such interest, the practice in acquiring knowledge in this fashion, is fittingly enough comprehended within the broad province covered by the Readers.

In regard to the second point: the somewhat ambitious designation "Literature" is suggestive of work unsuited to schools, and may tempt the inexperienced teacher beyond the range of his pupils. It is true that the more profound and many-sided the teacher's own study of the selections, the wider his reading and the more subtle his analysis of literary effects, the better it is for his scholars; yet this width and depth of knowledge, should, in the main, affect his teaching in an indirect way only. To attempt to impose upon immature minds the higher results of literary investigation, is simply to exhibit a lack of that sound sense and judgment indispensable in all good teaching. Advanced criticism deals with the analysis of the effects of literature and of the way in which these effects are produced. But at the elementary stage to which school-children have attained, our business is with the production of these effects, not with the analysis and classification of them. Our end has been attained if we enable the child to read easily, if we cultivate the habit and stimulate the desire of reading, and teach him how to appreciate and enjoy what he reads. The attempt to analyse and account for the vague and nascent literary perceptions of the beginner, will probably

result in destroying them, or, at least, in mingling repellent associations with what ought to be only pleasurable. The devotion of much time and thought to the definition and classification of rhetorical terms, figures of speech, qualities of style, and so forth, is incompatible with the attainment of the real ends of elementary teaching in literature. Here, as elsewhere, the student should be made acquainted, not with mere words, but with things,—in this case, with the concrete experiences and feelings that literature should afford. The boy, who, hearing *the Mariners of England*, or *Horatius at the Bridge*, feels his pulse quickened, his heart stirred in sympathy with the sentiment or situation, who finds a pleasure in the imagery and the swing of the verse, has had a genuine literary experience and made a real step in literary culture. And if the teacher succeeds in arousing such elements of pleasure in connection with a number of different pieces in prose and verse, he has opened the doors of literature to his pupil, has put him in the way of deriving permanent pleasure, information, and culture from books—in other words, he has attained what are the true aims of the teaching of literature in Public Schools.

Aims of Teaching Literature in Public Schools—More explicitly, then, the object of the teaching of the Readers is, (1) To show the pupil how to read, how to turn the printed symbols into the ideas which they represent; (2) To broaden knowledge, to quicken intellectual curiosity, to stimulate that general interest in men and things which belongs to every cultivated man, and which depends, in a great measure, upon books for gratification;

(3) To awaken the appreciation of literature proper, to develop the ability to feel the beauty and power of literature in its narrowest and highest sense.

Importance of Interest in the Study of Literature—Now, the taste for reading, the sense for the beauty of literature cannot be developed except pleasurably; if the method be dry or repellent, the end cannot be attained. Hence, there is something unique in this subject. When a pupil is engaged in the study of arithmetic, or grammar, or writing, mental discipline is given, and practical skill is imparted, whether the process be an agreeable one or not; but the chief end of the study of literature cannot be reached, unless the associations therewith are pleasant, and the pupils are borne forward by their own interest and enjoyment. But, if for this reason the difficulties of teaching the subject are enhanced, on the other hand, they are lessened by the variety and scope of the matter treated and of the methods that may be employed. While remembering the evils of needless desultoriness, we may yet say that *any* passage from good literature that appeals to the intellectual curiosity or to the taste of the pupil may be studied, and that *any* method may be used which serves to bring the subject in hand into relation with the reader's previous knowledge and experience, or into touch with his sympathies and emotions.

How to Stimulate Interest—How, then, may interest be stimulated? First of all, by bringing what is read into relation with actual things, by making the pupil *realize* the statements, the situations, the persons of the lesson. For the beginner, at least, the mere fact that ideas are conveyed

through the printed page, is enough to impart an unreality and aloofness to them. It is extraordinary how a child may understand each word and sentence, and yet somehow the thoughts contained may never penetrate beyond the surface of his mind. Nearly all mature persons have had a similar experience of the unreality and remoteness of the facts, for example, of Greek or Roman history,—an unreality of which we are scarcely aware, until some touch of nature, some commonplace incident awakens in us the sense that Greeks and Romans were real men who, like ourselves, lived and felt; we at length *realize* facts which we had all along understood. In like manner, the skilful teacher will change the vaguely and feebly apprehended ideas of the printed page, into vividly realized conceptions similar to those which are produced by the pupil's own experiences.

To attain such results in the case of those extracts which are not specially literary, but are primarily designed to waken curiosity and broaden knowledge, the methods employed will rather be those of science than of literature. For instance, when reading the selection entitled *A Piece of Coal*, the teacher will exemplify in actual specimens the various assertions of the author. When the lesson is on *Canadian Trees*, not only will he exhibit, as far as lies in his power, leaves, bark, etc., but he will, by questioning, make sure that his pupils recognize the various species; he will find out what they themselves have noted in regard to trees, will cultivate habits of observation by drawing attention to the branching, habitat, and other peculiarities of familiar varieties.

In the case of lessons—historical and other—that have to do with the life of the race, the outlines should be filled up with interesting details from the teacher's own reading, and should be illustrated by some familiar parallel cases. If, in preparation for such work, the teacher each session broadens his own acquaintance with the subjects treated, the lesson will gain a new interest for himself; and even when the newly acquired information is beyond the range of the students, his own freshened perception of the significance of the old theme, will lend that animation and interest which are essential to the successful teaching, and are yet difficult to retain in connection with hackneyed work.

Oral Reproduction—The special bar interposed between the pupil and the ideas of the author, by the fact that they are conveyed in literary form and through written symbols, may be partially overcome by the oral reproduction of them in more conversational and familiar style. That such a bar does exist, is shown by the observation of the young, and of persons unaccustomed to reading. Little children greatly prefer to have a story told in the natural language of the narrator, rather than read from the printed page. In maturer life many can follow a lecture with pleasure and advantage, who would find a chapter in a book, on a similar theme, much less attractive and profitable. And this difference does not arise merely from the words being addressed in one case to the ear, and in the other to the eye; for the speaker who uses a manuscript or recites from memory, is at a great disadvantage with a popular audience, as compared with him who employs

language and develops the theme on the suggestion of the moment. The obstacle caused by the unfamiliar medium should be smoothed away by the teacher, until gradually the turning of the printed symbols into the requisite thoughts, images, and feelings, may become second-nature; as it is second-nature in the case of every cultivated man. One method of beginning this process is to prepare the pupils for the printed text by oral reproduction in more familiar language. This will be specially useful in junior classes. If the teacher's treatment is successful, the pupil comes to his task with his curiosity already quickened, and his mind predisposed to catch the chief points of the lesson as well as its general bearing. The teacher need not, and, as a rule, should not, limit himself to a bare paraphrase of the original; he should emphasize and enlarge upon those points which are likely to be the most interesting and suggestive, filling out details, illustrating from the pupils' own knowledge and experience, and so forth. For higher classes, this preparation may often be superfluous; but in certain lessons, it will prove not less advantageous for them than for younger students. To do this sort of work really well requires both long practice on the teacher's part, and special preparation for each day's lesson. Such oral reproductions should not be memorized; the language employed and general form should be left to the suggestion of the moment.

Reading Aloud—Another method for the stimulation of interest and for the interpretation of a selection, especially of those pieces which have marked literary excellence, is reading aloud. That the reading may

be effective, the teacher must, first of all, himself feel the writer's power. He should be able, in the second place, in some measure at least, to put his feeling of the charm and beauty of such a piece as *The Vision of Mirza* or *Gray's Elegy*, into his vocal rendering. Successful reading requires perfectly clear and distinct enunciation, so as to impress itself upon the ear of every pupil without any effort on his part. Slovenliness of enunciation and weakness of voice are utterly destructive of attention. It must further be remembered that reading, particularly the reading of poetry, should be leisurely, so that the mind may have ample time to catch and connect each idea. Each piece, even if familiar, should have been read aloud repeatedly by the teacher in preparation for the class; for the proper rendering of the sense of a passage requires the adjustment of many elements which cannot be left to the impulse of the moment. A great source of charm in reading lies in the physical peculiarities of the voice, the proper use of the organs of utterance, the control of the breath, the seizing of the proper pitch and tone. The dramatic rendering of the thought is not here referred to; but simply the management of the voice, so that it shall be free from hoarseness and the sense of strain, and may flow with ease and smoothness. These are all qualities which may, in a considerable measure, be cultivated. In other respects, of course, the reading should be as good as possible, and the voice suitably varied in harmony with the sentiments. The last result is, perhaps, best attained unconsciously by a reader who has a properly cultivated voice, and a proper understanding and feeling for the passage upon which he is engaged.

But so-called *dramatic* reading should be avoided; anything is to be shunned that distracts the attention from what is read, to the reader. The latter is the mere medium for the effective transmission of the writer's thoughts, and he should, as far as he can, efface himself. Besides, dramatic reading even at its best, gives an opportunity for burlesque, and the schoolboy's sense of the ridiculous is keen.

The Specific Work of the Student of Literature—What has been said so far, applies to the Lessons of the Readers in general; let us now turn to what is more especially our theme, the consideration of literature in its more proper and narrow sense, and to the third of the aims mentioned above as belonging to the subject with which we are concerned,—the awakening of the sense of the beauty and power of literature. What, we may ask, is the business of the student of literature as such? It is his function to understand exactly and fully what the author means The printed symbols represent something in the writer's consciousness: it is the aim of the student of literature to reproduce within himself, the state of mind of the writer which is indicated by these printed symbols. In certain cases this is a comparatively simple matter. For example, Mr. R. A. Proctor knows certain facts about the heavens, which are set down in the lesson on *Fixed Stars*. The process of understanding him is a simple and purely intellectual one; on the other hand, in the case of the lesson entitled *National Morality* the reader who apprehends merely the ideas, and the line of argument of Mr. Bright, has not caught the complex mental state which the orator intended to convey. Besides

understanding the thoughts, the person who truly appreciates this selection feels also the glow of enthusiasm with which Mr. Bright regards his facts, and catches through the form and style the contagion of lofty emotion. The latter selection is literature in a fuller sense than the former: it has beauty, it has power beyond the mere thoughts conveyed; its form and expression are shaped by the writer's feelings, and, to a person of literary culture, communicate these feelings.

Literary Interpretation—In the widest sense of the word "literature," all recorded thought is literature, and all recorded thought requires a process of interpretation: we must understand the words in the sense in which the writer employs them; we must put them together so as to get at his assertions; we must perceive the relations of the assertions to one another; we must grasp the whole outcome of the passage. In the case of writings purely matter-of-fact or scientific, the literary student's work is then complete. But if the work under consideration belongs to literature in its narrower sense, this is merely the first stage of interpretation. When we have thus attained the substantial meaning, we must further feel fully the way in which these substantial thoughts shaped themselves in the author's mind, the way in which he looked upon them, and the feelings which he had about them. All these conditions in the writer's mind modify his form and expression. The account of Canadian trees in the *Third Reader*, is a bare statement of facts; since the modifying conditions of feeling are absent, the expression is almost without

literary character. So sometimes we find a writer narrating a series of historic events, almost without arrangement or connection other than is imposed by the events themselves,—without indication as to which were the more important, and which the less important facts. Such a one is a mere mechanical recorder. But an historian like Macaulay marshals his facts, brings certain events into prominence, subordinates others to them, and, merely in virtue of his doing so, his work becomes literary. His view of the fact is indicated in the form—in the paragraph structure, for example. Accordingly, if a reader (as young children are apt to do) merely takes the facts as they come, without perceiving the connection and relative importance given them by the writer, he fails to apprehend the literary qualities of the work. Hence the teacher should, by question, ascertain what the pupils think is the outcome of a passage, should test by means of oral or written reproductions, whether they have grasped the connection and importance of ideas. He should point out how the paragraphs are framed, how successive paragraphs are related to one another, and so forth.

But still, we are not in the domain of literature in its fullest sense, but in the realm of such written thought as is chiefly valuable for the information that it gives.

Literature Proper—We recognize that the oral reading of a passage which is valuable merely for the facts conveyed, is a much easier matter than the reading of such pieces as the scene from *King John*, (*Fourth Reader*, No. CI.), or *Lochinvar*, which are not valuable as information. The substantial

meaning of these two selections might, indeed, be conveyed in the simple and unvaried style of a passage written for information only. But there is something beyond what is thus conveyed—a something which does not exist in the matter-of-fact lesson, a something represented by the varied modifications, tones, inflections, of a good reader's voice. The elements represented by the play of the voice are the purely and essentially literary elements. Such reading brings out, for instance, the music and cadence of the lines and the changes of feeling in keeping with the ideas expressed. The child should be taught to apprehend and feel these, as well as that substantial meaning which might be produced by a monotonous vocal rendering or in a prose paraphrase. The best method of attaining this end is, as has been already said, good oral reading. But the teacher should also dogmatically point out such literary qualities as are within the pupil's comprehension—that the rhythm of the line is suitable, the imagery beautiful and suggestive, this or that passage particularly effective. Let not an exaggerated reverence for the deductive method lead the teacher to abandon his real position of superiority. He is able to perceive much that a child cannot perceive for himself, and which the most skilful questioning will never educe. The pupil should be informed, with a judicious consideration for the limitations of his powers, that such and such qualities exist in a passage that it should awaken such and such a response in himself; he should be urged to read and re-read the passage with this information in mind. In time, some, at least, of the qualities

contained, will gradually dawn upon his perception. No method is more effective than this; for after all, the greatest instrument of literary culture is continued familiarity, under competent guidance, with suitable examples of good literature within the compass of the pupil's appreciation.

We are now in a better position to comprehend the worth and the permanence of true literature. Such literature possesses power and beauty apart from the substantial facts or thoughts to which it gives expression—a power and beauty which must therefore be contained in the expression, in the form. If a book is valuable only for the bare ideas contained, when we have mastered these ideas, we cease to read the book; and books of this character sink into oblivion with each generation. But when there is some special charm or force in the expression, to recall the substantial thought does not produce upon us the effect of the book itself; the actual words must be before us, either inscribed upon the material page, or upon the tablets of memory. Hence the permanence of literature, the preservation of such books as the *Iliad* through ages. Hence, too, the inexhaustible value of literature for each individual reader, and its unending solace and charm.

Examples of Essentially Literary Qualities—Let us illustrate, in a specific example, the difference between mere recorded thought and literature proper. We might find in a purely matter-of-fact treatise, some such statement as the following: "The extinction of man and of all that he has produced, is assured by the action of certain forces on the terrestrial globe, which must ultimately result in the

destruction of that body and its return to its primitive nebulous condition." The same substantial sense is contained in the well-known passage of Shakespeare's *Tempest*:—

> " And, like the baseless fabric of this vision,
> The cloud-capped towers, the gorgeous palaces,
> The solemn temples, the great globe itself,
> Yea, all which it inherit, shall dissolve
> And, like this insubstantial pageant faded
> Leave not a wrack behind. We are such stuff
> As dreams are made on, and our little life
> Is rounded with a sleep."

The substantial ideas contained in these two versions are the same. But the aim of the prose passage is merely to convey them intelligently to the mind of the reader. In the prose passage intellect is addressing intellect; there is no attempt to give beauty to the language or to indicate what the writer may have felt in regard to the matters stated, or to produce an emotional effect of any kind upon the reader. Yet if we actually believe and realize these facts, there will be a stimulation of certain feelings in regard to them. Now, Shakespeare states the same fundamental ideas in such rhythm, language, and imagery as will naturally excite in persons of literary aptitude a befitting emotional accompaniment,—a sense of the awfulness, the grandeur, the solemn import of the facts. It is conceivable that a reader may not feel the stimulus of the form; there are many hard-headed people, little open to æsthetic impressions, who would get nothing more than the substantial sense of the passage, and by whom the qualities of expression in

which the poetical differs from the prose passage, would be regarded as frivolous and meaningless verbiage; in such persons the literary sense has not been developed. The teacher, whose business it is to awaken this sense, will see not merely that the substantial meaning is apprehended, but further—a more difficult matter—that the literary effect is also felt. The reading of such a passage should stimulate, should quicken and elevate the feelings, should impart the sense of exquisite beauty and charm. Of course such results cannot, indeed, be fully attained with immature minds. Literature is written for mature men and women with wide experience and developed sentiments, and much literature is quite unsuitable for schools. It is not, however, to be granted that only what is wholly within the range of the child's mind is to be read; but for careful study, pieces should be selected, of which the main sentiment and qualities are within the pupil's comprehension.

Imaginative Literature—A very large and very important part of literature proper—the drama, the epic, narrative poetry, prose fiction, description—aims at presenting the concrete,—what in real life we apprehend through our senses, what we see, hear, or feel. The authors of such literature possess powerful imaginations; they can summon before the mental eye, with extraordinary clearness, images similar to those impressed upon the consciousness by the external world; it is the aim of their writings to enable the reader to apprehend, with vividness, these visions of theirs. Accordingly, just as in the case of lessons with regard to natural objects and

phenomena, it is incumbent on the teacher to see that the pupil has these objects and phenomena clearly in his mind, instead of mere words, or vague conceptions; so, in the case of imaginative literature, he must see that the pupil forms concrete pictures in his brain—and these as vivid and accurate as possible—of the persons, scenes, and situations presented. The details should be vividly conceived, and should take their proper places in the completed picture. Diagrams, or illustrations from more familiar experience may be employed to give reality to these imaginative conceptions. It should be further noted that the language of poetry is picturesque, even where the theme is not; such language can only be appreciated when the imagery awakens the appropriate concrete images in the reader's mind.

Poetry—The fullest exhibition of literary qualities and the utmost perfection of literary form is to be found in poetry; and although the great mass of poetry treats of experiences, and appeals to feelings, beyond the range of childhood, yet children are sensitive to poetic effects within certain limits. They have, for example, marked susceptibility to the rhythm and metre which are distinctive of poetry; and are undoubtedly stimulated and pleased by poetic passages which they only vaguely understand. In the case of poetry, particular care should be given to minute interpretation; for its language presents many difficulties, which familiarity sometimes leads the more mature reader to overlook. Its phraseology is often extremely pregnant and condensed, the links of connection in thought omitted, the order of words confusing, the vocabulary unfamiliar, the imagery

full of suggestiveness and picturesque effect Questions and explanations are needful to elucidate these various points. But, after all, it should be remembered that the general meaning and outcome, the stimulus to the pupil's imagination and to his sense of beauty are the matters of greatest importance, and with these the study of the poem should begin and end.

Method of Studying a Poem—If any one reflects upon his own method of studying a poem, or of any other piece of literature which presents similar difficulties, he will find that it is gradual advance from the obscure and vague to the clear and definite. This is the natural method and should generally be followed in teaching. We do not determine exactly the meaning of each word and phrase as we come to it, and in this manner arrive at the drift of the whole. Such a method of procedure cannot be consistently carried out; the possibilities of meaning in words and phrases are too numerous for so straightforward a course. The process we actually go through is similar to that of the learner in translating a sentence from a foreign language. He has an idea, more or less elastic, of the meaning of all or most of the words in the sentence, but he is not sure of the exact sense in which each is used. This vague knowledge of the particulars gives him a suggestion as to the drift of the whole sentence. Upon this hypothesis he proceeds, and ascertains if it can be maintained on a more exact scrutiny of the individual words. He probably finds, if the sentence be at all difficult, that the more detailed examination will lead him to modify his conception of the whole outcome. So a

species of mental see-saw goes on; at each stage by the influence of the details upon the whole, and again of the whole upon the details, he makes a closer and clearer approximation to the real sense. So it is with a poem. After being read, the pupil should be interrogated in some general fashion, as to the subject,—what it is all about; then, what the first stanza or sentence contributes to that general outcome, and so on. The first answer accepted will probably require to be modified by the light thrown upon it by answers to subsequent questions. Some fairly true general conception having been thus arrived at, the more detailed investigation of the force of each word, phrase, image should follow. This general conception will thus be filled out and probably modified. When the piece has thus been carefully examined, the initial questions should once more be put and answered. Finally, the special beauties, the significance, the truth of the poem should be pointed out, and the piece read aloud as effectively as possible, by teacher or pupil.

An Example—Take, for example, such a poem as Scott's *Lochinvar* (*Fourth Reader*, No. LIV.), a sort of poem well suited to the young, because it deals with active life, indicates a story, is rapid in its movement, and through its very condensation, stimulates the exercise of imagination in filling up links and suggested details. After the pupils have familiarized themselves with this piece, and the teacher has read it aloud with spirit and feeling, a succession of questions might be put:—what is the main thing narrated; who was Lochinvar; what was

his character; what other persons appear in the poem; their relations with the hero; why we sympathize with him; could such an event as this happen in our time; what conditions of society does it indicate. The teacher may here give an interesting sketch of the state of the Borders at the supposed period of the story, and its causes. Then the pupils might be asked to describe in detail the picture suggested in the third stanza; what is the next scene presented; and so on; the purpose of the first stanza, of the repetition in the last two lines, etc. The story might then be told as a consecutive narrative (not in the fragmentary method of the poet) by one of the pupils; and subsequently it might be written by all as an exercise in composition. Attention should be drawn to the metre,—its suitability, the rapidity of its movement caused by the frequency of trisyllabic feet; the characteristics of the stanza might be further brought out by comparing it with other stanzas to be found in the Reader, *e.g.*, with that of Gray's *Elegy*. The detailed interpretation should follow; words like *brake*, *measure*, *galliard*, etc., must be explained, and the understanding of more commonplace words, *dauntless*, *ford*, *craven*, etc., be tested by questions; attention should be drawn to the purely poetical character of some words like *steed*, *quaffed;* the comparison contained in the first two lines of the 4th stanza will require a full explanation, and so on. Then the distinguishing qualities of the poem may be pointed out in simple language: its animation, its wonderful condensation and suggestiveness, its picturesque force, its development, its unity.

Detailed Examination of Language—In the teaching of the Readers a great deal of work may be done in the detailed examination of the meaning of words and phrases, the reasons for their use, the effect of the substitution of synonyms, and so on. The nature of this work is pretty fully indicated in the Regulations of the Department of Education, and need not here be further dwelt upon. It may not be amiss to insert a caution that the teacher should see that interpretation does really interpret. Definition is often purely formal, the substitution of one word or phrase for another, but definition ought to bring the word from the sphere of the unknown to the known. The language employed in definition should be such as to have substantial meaning for the child. Explanation should, by substitution or comparison, bring the thing explained into the sphere of the familiar. Further, it should be remembered that this detailed work ought not to overwhelm the truly important matters: the real appreciation of literature, the understanding and feeling for the whole. The temptation is, of course, to spend the time on this less profitable but easier work of detailed annotation, but that is not the way to teach literature or to instill the taste for reading. Finally, it is better to employ part of the time assigned to lessons in literature to supplementary reading, or to the reading aloud by the teacher of suitable extracts of which the pupil is required to give an outline from memory, than to overdo the interpretation of the pieces in the Reader, and to destroy the interest and enjoyment by excessive

minuteness, or by entering upon themes and matters beyond the pupil's capacity.

Lesson based upon a Prose Passage—Thus far, we have been indicating, in a general way, what we may aim at in teaching selections from the Readers, what methods may prove useful; and finally, we have endeavored to bring clearly into consciousness what literature does for its readers, and what is its special function in its truest and narrower sense. These last points are of special importance because the lack of clear apprehension on the teacher's part of what literature is and what it does, often leads to vagueness in the teaching of the subject, and the employment of methods which do not subserve the real purposes of literary instruction. In order to make still clearer the aims and methods of the teaching of literature proper, it will not be amiss to show in detail what may be done with a specific piece of literature in the class.

Now, it is impossible to exemplify on paper, actual teaching. Actual teaching, as all other practical matters, is in a large measure determined by circumstances and conditions which are never twice the same. A large part of a teacher's skill lies in the sympathetic perception of these conditions, and in the power of adapting himself to them on the spur of the moment. The teacher should have a definite aim in view, and a general conception of the proper method to be followed; but these will be modified by the character of the pupils before him, of the answers given, of the manifestation of interest, and the comprehension of the various points brought forward. A question quite proper in one case, will be quite out of

place in another. What knowledge should be imparted by the instructor, what elicited from the pupils themselves, what matters dwelt upon, what lightly passed over,—these things can only be determined by the actual circumstances. The teacher should be especially careful not to reject an answer wholly, because it is partially incorrect. The only answer to be received with rebuke is one which is the result of carelessness, or inattention. In other answers there will usually be some germ of truth; upon this the judicious teacher will seize, and by further questioning eliminate what is superfluous or erroneous. He will not rigidly hold to the line he intended to follow, but develop that to which the answers naturally lead. All of this goes to show that in attempting to work out a lesson on paper, we are indicating roughly what *might* be done,—not what necessarily should be done.

Let us take, first, the following prose extract from the *Third Reader* entitled

NATIONAL MORALITY.

"I believe there is no permanent greatness to a nation except it be based upon morality. I do not care for military greatness or military renown. I care for the condition of the people among whom I live. There is no man in England who is less likely to speak irreverently of the Crown and Monarchy of England than I am; but crowns, coronets, mitres, military display, the pomp of war, wide colonies, and a huge empire, are, in my view, all trifles light as air, and not worth considering, unless with them you can have a fair share of comfort, contentment and happiness among the great body of the people. Palaces, baronial castles, great halls, stately mansions, do not make a nation. The nation in every country dwells in the cottage; and unless the light of your Constitution can shine there, unless the

beauty of your legislation and the excellence of your statesmanship are impressed there, on the feelings and condition of the people, rely upon it, you have yet to learn the duties of government.

"I have not pleaded, as you have observed, that this country should remain without adequate and scientific means of defence. I acknowledge it to be the duty of your statesmen, acting upon the known opinions and principles of ninety-nine out of every hundred persons in the country, at all times, with all possible moderation, but with all possible efficiency, to take steps which shall preserve order within and on the confines of your kingdom. But I shall repudiate and denounce the expenditure of every shilling, the engagement of every man, the employment of every ship, which has no object but intermeddling in the affairs of other countries, and endeavouring to extend the boundaries of an Empire which is already large enough to satisfy the greatest ambition, and I fear is much too large for the highest statesmanship to which any man has yet attained.

"The most ancient of profane historians has told us that the Scythians of his time were a very warlike people, and that they elevated an old scimitar upon a platform as a symbol of Mars, for to Mars alone, I believe, they built altars and offered sacrifices. To this scimitar they offered sacrifices of horses and cattle, the main wealth of the country, and more costly sacrifices than to all the rest of their gods. I often ask myself whether we are at all advanced in one respect beyond those Scythians. What are our contributions to charity, to education, to morality, to religion, to justice, and to civil government, when compared with the wealth we expend in sacrifices to the old scimitar?

"Two nights ago I addressed in this hall a vast assembly composed to a great extent of your countrymen who have no political power, who are at work from the dawn of the day to the evening, and who have therefore limited means of informing themselves on these great subjects. Now I am privileged to speak to a somewhat different audience. You

represent those of your great community who have a more complete education, who have on some points greater intelligence, and in whose hands reside the power and influence of the district. I am speaking, too, within the hearing of those whose gentle nature, whose finer instincts, whose purer minds, have not suffered as some of us have suffered in the turmoil and strife of life. You can mould opinion, you can create political power—you cannot think a good thought on this subject and communicate it to your neighbors—you cannot make these points topics of discussion in your social circles and more general meetings, without affecting sensibly and speedily the course which the government of your country will pursue. May I ask you, then, to believe, as I do most devoutly believe, that the moral law was not written for men alone in their individual character, but that it was written as well for nations, and for nations great as this of which we are citizens. If nations reject and deride that moral law, there is a penalty which will inevitably follow. It may not come at once, it may not come in our lifetime ; but rely upon it, the great Italian is not a poet only, but a prophet, when he says—

> 'The sword of heaven is not in haste to smite,
> Nor yet doth linger.'

"We have experience, we have beacons, we have landmarks enough. We know what the past has cost us, we know how much and how far we have wandered, but we are not left without a guide. It is true, we have not, as an ancient people had, Urim and Thummim—those oraculous gems on Aaron's breast—from which to take counsel, but we have the unchangeable and eternal principles of the moral law to guide us, and only so far as we walk by that guidance can we be permanently a great nation, or our people a happy people."

Remarks Introductory to the Selection.—The author of this extract is John Bright, son of a cotton spinner and manufacturer in the north of England; the family were Quakers. John Bright attracted

public notice in connection with the agitation against the Corn laws, was elected to Parliament, and became one of the most distinguished orators and public men of his day. As a speaker he was distinguished for his skill in exposition, for the simplicity, smoothness, and energy of his style, and for the power which comes from high character, sincere convictions, and the constant appeal to lofty motives and ideals. It must be remembered that a speech is intended to be spoken, and a mere reader labors under great disadvantages; he loses the charm of tone and utterance, and (especially in the case of a man of Bright's stamp) the weight that comes from character and feeling—things easily perceptible when we hear and see the orator himself, but much less manifest on the printed page.

The extract before us is merely the conclusion of a long speech attacking the foreign policy usually followed by English statesmen, which, as Mr. Bright thought, too often involved the nation needlessly and wrongfully in war. It was delivered at a banquet given at Birmingham in Bright's honor, October 29, 1858. During the three years immediately preceding, ill health had prevented him from appearing on the public platform. At the date of this speech foreign affairs were threatening, and the Crimean war (1854-1856), was fresh in the minds of his hearers; it seemed a fitting time to raise his voice against an almost universal tendency (to which he was himself on principle opposed), to regard military achievements as the highest part of a nation's activity and its greatest glory. He believed that true national greatness lay in other things; for

example, in the happiness of the people at large. He considered that there could be no true greatness which was not based upon morality, *i.e.*, upon the same principles of conduct as we acknowledge to be right when individual men are concerned. Now, in general, no such moral standard seems to be held as regards nations; for example, a man who takes by force his neighbor's property, does not thereby win the admiration of his fellows, but is punished; whereas the seizing of the land of one nation by another is often considered a glorious exploit. Mr. Bright strives, in the extract we are about to study, to disabuse the minds of his hearers of these views—immoral and pernicious as they seemed to him.

Some remarks of the kind given in the last paragraph should serve as an introduction to the piece, and we will suppose that the pupils have subsequently had an opportunity to read the extract carefully over by themselves. The study in class of the piece in detail may then be begun.

First Paragraph.—*Why does the orator begin with the particular assertion contained in the first sentence?* It states the theme of the whole extract.——*Why does he make a negative assertion, instead of the positive one, that the permanent greatness of a nation is based upon morality?* The proposed positive assertion is not so strong, for it is quite consistent with military glory being one factor in the greatness of a nation, and that Bright does not believe.——*What connection has the second sentence with the first; or, in other words, why does the orator make the assertion contained in the second sentence at this particular point?* In the first sentence he states that he is going to maintain: in the second that he is going to argue against. It will be noted one of the best ways of making clear what a person asserts is to express what he implicitly intends to *deny* by his assertion.

These first two sentences, then, are introductory to the whole extract.

State briefly what is the subject of the rest of the paragraph? The comfort and happiness of the people at large is the true test of national success.——*What is a "coronet?" a "mitre?" (lines 6-7).—What is really meant here by "crowns, coronets, mitres?"* Kings, nobles, bishops, and the state and grandeur that pertain to them.——*What sort of language is this?* Figurative.——*Has this language any peculiar appropriateness here?* The words employed make us think of the *external splendour* connected with these orders of the State; and it is their *splendour* that is in point here; compare the next phrases, "military *display*, the *pomp* of war."——*What is the exact meaning of "pomp?" (line 7). Show its suitability in this connection.* (Consult dictionary and etymology).——Note the alliteration in the enumeration of details in lines 6-7. Again note the picturesque language, "palaces, baronial castles," etc., (lines 11-12).——*What relation does the sentence beginning "The nation," (line 12), bear to the preceding?——Explain how the "beauty of legislation" and "excellence of statesmanship" may be impressed "on the feelings and conditions of the people."* By helping them to be contented, ("feeling") and prosperous ("condition").——*Why does the speaker introduce, after the first two sentences, these sentences asserting the supreme importance of the comfort and happiness of the people at large?* As his audience might be little inclined to agree with his views as to military greatness, he introduces something to which they will naturally assent, which is, yet, inconsistent with military exploits being regarded as the main factor in a nation's greatness; for war is evidently at variance with the comfort and happiness of the people at large.

Second Paragraph.—*State briefly the substance of this paragraph.* The speaker does not object to military expenditure if limited to purposes of defence and maintaining internal order. ——*What relation does this subject bear to what has gone before?* It serves to explain or define the position that he has taken up against needless wars; or it serves to meet an objection that might be made to his position.——*What two parts does this paragraph naturally fall into?* An assertion of what he deems

justifiable as regards military expenditure, an assertion of what he deems unjustifiable. Observe, how, again, we have the positive and negative sides in order to define his position with the utmost clearness.—The clause, "acting upon known opinions . . . . . the country" (lines 22-24) is introduced because Bright has in mind the principles of the Quakers, who are opposed to war under all circumstances; although he may in his heart sympathize with these principles, he does not object to the government acting in accord with the opinions of ninety-nine hundredths of the nation.——*What is the meaning of "repudiate" (line 27)?*——Note the circumstantial and detailed character of lines 27-29.——*What is the effect of this circumstantiality and detail?* It gives emphasis and strength to the speaker's assertions.——Note the difference between the spirit of the latter part of this sentence (lines 29-34) and the imperialistic ideals and tendencies of our own time.

Third Paragraph.—*What is the meaning of "profane" (line 35) here?—What is the more common meaning in ordinary conversation?*—The most ancient of profane historians is Herodotus.——*Who were the Scythians?—Who is Mars?—Into what two parts does this paragraph fall, and what does each part do?* The first part states some facts about the Scythians, the second applies these facts to the English nation, or suggests a resemblance to certain facts true of the English.

It is difficult for people to look impartially on the actions of their own nation, as it is difficult for men to judge impartially the actions of the members of their own families. Hence the common device of leading a person unconsciously to judge his own case in the case of another; so admirably illustrated by Nathan's parable to David (See II. Samuel xii. The story might be told to the children). So, Bright here attempts to make his audience feel the undue value they place upon war and its barbarous character, by hinting a certain resemblance between the attitude of Englishmen towards war and that of the bloody and barbarous Scythians. Besides this, a sudden reference to a remote and seemingly unrelated subject has the effect of rousing the attention and relieving the strain of a long treatment of a single theme; for it must be remembered that this extract in the Reader is but a small part of a long speech.

What advantage is there in the speaker's asking questions instead of making assertions at the close of the paragraph? It is often more effective to suggest something and to let the hearer think it out for himself, than to affirm it; especially when the assertion is painful or uncomplimentary to the hearer, and might rouse opposition on his part.——*To what does the speaker refer in the "wealth we expend in sacrifices to the old scimitar?"* ——*Why is the phrase "sacrifices to an old scimitar" employed rather than some direct expression like "warlike expenditure?"* It serves to keep before the mind the real resemblance between the barbarous sacrifices to Mars, and the sacrifices modern Englishmen make to the warlike spirit.

Fourth Paragraph.—*What is the orator's aim here? How does it differ from his aim in the earlier part?* Hitherto he has been trying to convince the intellect of his hearers of the truth of his position, now he tries to move them to *act* upon this conviction. It is the natural thing at the close of the speech, to introduce the practical application.——*To whom do you suppose the speaker is referring in "your countrymen who . . . . . subjects" (lines 49-52)?* The franchise in towns was at this date confined to householders who paid an annual rent of £12; this excluded a very large body of workingmen. Two nights before, Mr. Bright had addressed a public meeting on the very subject of the extension of the franchise and parliamentary reform.——*To whom is reference made in "those whose gentle nature . . . . . of life" (lines 58-60)?* Women. ——*Why is the phrase "within the hearing" (line 58) employed instead of the simple "to?"* The ladies were not actually at the banquet, but only present as spectators in the galleries. ——*Give the reasons for the choice of each of the epithets (lines 58-60) which he applies to women, so as to show why he prefers these to many others which are equally applicable to women.—What is it that "some of us have suffered?"—What is the practical course he now urges his hearers to adopt?* To think over and discuss these subjects of which he has been talking.—— *What general principle, as to the way the English government acts, underlies this sentence?* That government will be influenced by public opinion.

In the following sentence, "May I ask," etc., (line 66),

Bright indicates a fundamental principle of his at variance with that of perhaps the majority of men.——*What reason is there for the different standard that we apply to the actions of men as individuals, and of men acting as nations? For example, is there any reason why it is more justifiable for a nation to take possession of territory by force, than for a man to seize upon goods by force? If one man thinks that another is in possession of his property, what does he do, if he acts properly?* He appeals to the courts.——*Is there any court for a nation to appeal to against another nation?* No.——*So there is no other way usually to settle a dispute except by recourse to arms? Is this answer absolutely true; do nations ever appeal to a third party to decide the case according to its merits?* Yes, in case of arbitration, as in the Alabama claims.——*What is the great difference between the conditions of private parties going before a Court, and nations before a Court of Arbitration?* In the case of nations, there is no external force to compel the parties to submit to arbitration, or to comply with the award; in the case of individuals, there is. So we see it is more difficult to arrive at equitable decisions as between nations, than between individuals; and this tends to make nations resort to force, to the principle that might is right, rather than to the principles of justice.——"The great Italian poet" is Dante. ——*What is the substantial meaning of the poetical quotation?*

Fifth Paragraph.—*What literally are the things referred to in "beacons" and "landmarks" (line 77)?—What has the past cost them?* There is doubtless a special reference to the loss of life, suffering, etc., of the Crimean war, which had recently been brought to an end. The vast national debt of England is mainly due to war.——*What guide have we?* This is indicated below, "the unchangeable and eternal principle of the moral law."—— "Urim . . . . breast," (line 81) see Exod. xxviii. 30, a pair of jewels on the High priest's breast-plate, employed as an oracle in critical junctures.

After the selection has been carefully studied, it should be read aloud either by the teacher or the best reader in the class. Finally, a brief outline might be written out by each of the pupils to exhibit the main thoughts of the passage and their proper connection.

Teaching of a Poetical Selection—In order to exemplify the teaching of poetry, let us take the following sonnet from the *Fourth Reader:*

SONNET.

"Mysterious Night! When our first parent knew
Thee from report divine, and heard thy name,
Did he not tremble for this lovely frame,
This glorious canopy of light and blue?
Yet 'neath a curtain of translucent dew,
Bathed in the rays of the great setting flame,
Hesperus with his host of heaven came,
And lo! creation widened in man's view.
Who could have thought such darkness lay concealed
Within thy beams, O, Sun! or why could find
Whilst fly and leaf and insect stood revealed,
That to such countless orbs thou mad'st us blind!
Why do we then, shun death with anxious strife?
If light can thus deceive, wherefore not life?"

Let us suppose that the pupils have been required to prepare this poem; further, that the teacher has read it aloud, so as to bring out, as far as may be, the meaning and feeling of the poet and beauty of the rhythmic melody. He may then proceed, after the usual method, to ask for a brief and simple statement of the thought of the poem, and so forth. Or, perhaps better, since the sonnet is likely to be obscure to the young student, he may adopt another course and develop the general meaning from an investigation of the significance of the successive statements. This method, at least, we will follow here.

First quatrain.—*What is the first thing that the poem makes us think about?* Night.——*Who is referred to in "our first parent" (line 1)? What is meant by "report divine" (line 2)?*

An account from God himself (see opening chapters of Genesis where God is represented as speaking with Adam).——*What is the ordinary meaning of canopy?—What is referred to in the words "this lovely frame . . . . . light and blue" (line 3-4)? —What, then, is the substantial meaning of the first quatrain?* When Adam first heard about Night, without having seen it, did he not dread its appearance, and fear that it might forever blot out the beautiful blue dome of the sky?

Second quatrain.—*What is the "great setting flame" (line 6)?* The setting sun.——"Hesperus" is the classical name for the evening star.——*What is the "host of heaven" (line 7)?* The stars in general.——*What is the meaning of "creation widened in man's view" (line 8)?* The darkness of night enabled Adam to see the vast multitude of heavenly bodies, and thus he got a wider view of the extent of the universe.——Everyone must have noticed the sense of immensity and grandeur produced by the sights of the starry heavens.——*What, then, is the substantial meaning of the whole of the second quatrain?* When Adam beheld the first night that he ever experienced, he became acquainted with a large part of the universe hitherto unknown to him.——*Indicate the connection in thought between the first and second quatrains; or what reason has the poet for saying what he says in the second stanza, after what he has said in the first stanza?* The first stanza tells what result Adam might naturally have feared in connection with night, when he had only heard vaguely about it; the second what was the result of his actual experience of night.

Third quatrain.—*What is meant by saying that "darkness lay concealed within the beams of the sun" (line 9-10)? Put the thought in simple prosaic language.* The rays of the sun hid something.——*What was it that the rays of the sun hid?* The universe of stars.——*Is that actually true?* Observe it is a fact that the light of the sun does prevent us from seeing the vast universe of which our earth is but an insignificant speck; whereas night reveals the universe to us. Notice also how the poet puts this in a very striking way. So that something of which we are all, of course, aware, is made fresh and vivid to us. This is a special example of that which poetry in general is fitted to do and is continually doing—the

imparting of freshness and impressiveness to what is familiar. ——*When is it that "fly and leaf and insect are revealed" (line 11)?* In the day-time.——*Why are these things especially selected? What common peculiarity have flies, leaves and insects, that leads the poet to mention them?* They are all small and insignificant.——*What is the ordinary meaning of orb?* ——*What are the "countless orbs" referred to in line 12?* ——Observe that the second exclamation is a repetition, in a more emphatic form, of the first exclamation of the quatrain. ——What effect does the poet gain by putting these two clauses in the form of exclamatory questions, rather than in the form of assertions, "No one would have thought," etc., and "We would never have found that whilst fly," etc. ?——The third quatrain, then, substantially states in general what was said in regard to Adam in the second quatrain, that while the sun reveals the earth and the various objects which it contains, it conceals a vastly greater and more stupendous world.

Final couplet.—*Put the substantial meaning of the question of line 13 in simple language.* Why do we dread death ?—— *How does light deceive us (line 14)?* It leads us to think that what we see in the day time comprises the whole universe. In the earlier part of the poem, our attention was directed to the fact that night gives us a wider and completer view of the universe than day.——"*Wherefore not life?*" *Expand this question by supplying the ellipsis.* Wherefore may not life deceive us ?

Development of thought.—Now let us see what is the connection in thought between the earlier part of the poem and these last two lines. *What did we find as the first idea presented by the poet in the poem?* Night.——The poet was thinking and speaking of night in the earlier part of the poem, telling us something that it does, and comparing this with what something else it does. *What is this "something else"?* Day. ——In the earlier part of the poem he spoke of night and day. *What is he talking about in line 13?* Death.——*And what is the subject or thing that he is speaking about in line 14?* Life.——*Is there any connection, then, which one naturally notices between night and day, on the one hand, and death and life on the other? Can you remember any phrases commonly*

used, or any passage in books that you have read, which indicate a resemblance or connection between these ideas? "The darkness of the grave," "night of death," eternal life is often styled "eternal day," etc. "Work while it is called to-day, for the night cometh when no man can work." John ix. 4. ——*There is a resemblance commonly traced between night and death, and day and life; and that doubtless suggested to the poet the bringing of these ideas together in the sonnet. In the last line there is a question asked, which is not answered (what is called a rhetorical question); such questions are always intended to suggest an answer; what is the answer suggested by the question of the last line?* Life may deceive us.——*What reason does the poet suggest for supposing that life may deceive us?* Day deceives us.——*In what respect did we find that day deceives us?* ——*The poet evidently insinuates that life may deceive us in a similar way; how then might life deceive us?* By making us think that what we see in this life is the whole of existence.—— *Now, there is another rhetorical question in line 13, what is the answer intended?* We have no reason to be afraid of death. ——*Is there any mention of fear or dread elsewhere in this poem?*——*Was Adam's fear of night justified when he actually experienced night?*——*It did him no harm; on the contrary, what did it do?*——*Observe in this line 13, the word "then" is used: what force has this?* It indicates that the two assertions implied in these two lines are the result of what has been said in the earlier part.——*The "then" indicates that there is a reason in the previous part of the poem for the implied assertion in this line that we have no ground to dread death; what is the reason?* Adam had no real ground for dreading night.——*Not only did night do him no harm, we have seen that it revealed to him the immensity and grandeur of the universe—showed him a world invisible by day. Now, since the poet is evidently thinking of a resemblance between night and death, day and life, he is insinuating or suggesting that death may probably have some effect similar to that which night had to Adam; what would be a similar effect?* That death should reveal a vastly greater and grander state of existence than life reveals.——*What was the difference between the things noted by the poet as revealed by day, and those revealed by night?* The former were trivial and

small, the latter great.——*And so what would be likely to be the difference in the character of things revealed by the present life, on the one hand, and by death on the other?*——*State briefly the substantial meaning of the final couplet.* We need not be afraid of death, any more than Adam needed to be afraid of night; for, not improbably, the view we get in this life, that the present existence is the whole of existence, and that death ends everything, is just as ill-grounded as Adam's thinking what he beheld in the day-time to be the whole of the universe.

The poem as a whole.—*Having got an idea of the meaning of the poem, suggest some appropriate title for this sonnet.* Night, Immortality, Night and Death, etc.——*Is there any reason to be urged for the second of these titles, as compared with the first? Do you think the idea of "Night" or "Immortality" is of more importance in the poet's mind in writing this poem?* The latter.——*What relation has the idea of Night to that of immortality in the poem?* It serves to suggest it, and introduces it.——*In what part of the poem, then, is the principal idea expressed?* In the final couplet.——*And what purpose does the rest of the poem serve?* To introduce this idea, give reason for it, give impressiveness and picturesque power.

The teacher may point out that a certain force is given to the main idea by thus including it concisely in the narrow limit of the couplet, whereas the introductory matter has a more roomy expression in the quatrains.

Form and Thought.—*What do you notice with regard to the rhymes of the first and second quatrain respectively?* They are the same.——*This common rhyme serves to connect these two stanzas together by the form—to make them stand together, and apart from the following quatrain, which does not rhyme with them. Are the quatrains likewise connected in thought?* Yes; they describe the incidents, the facts about night and day, which occasion the chief idea of the poem.

It will be noted that the third quatrain gives expression to reflections suggested by the incidents mentioned in the previous lines; and that the final couplet contains the principal thought which is the outcome of the whole. So the natural divisions of the sonnet made by the arrangement of rhymes correspond to stages of thought.

Miscellaneous points.—Let us note some further points in the poem. "*Mysterious Night*," (*line 1*). *Is there any special appropriateness in this adjective here? What is the meaning of "mysterious?"* Full of mysteries, *i.e.*, full of hidden things, of secrets.——*And is this aspect of night, as full of hidden things, important in this poem?* Evidently it is the fact that night was full of hidden things that were revealed to Adam, that leads the poet to think that death may be a revelation of another existence.

Lines 3-4.—*Apart from language and expression, is there any special beauty in these lines?* The beauty of the picture suggested of the starry heavens. Notice, these lines make us think of a beautiful thing in nature, and freshen in us the sense that this thing is beautiful. That is another example of what poetry in general does for us; it fills us with pleasure by recalling to us beautiful things and experiences, and leads us to notice beauty which may have been unnoticed altogether, or may have become less impressive through familiarity.

What other example of this same thing have we in the poem? The suggestion of the beauty of sunset and evening in lines 5-8. ——"*Translucent*" (*line 5*)—*meaning?—Can you recall another word with similar meaning?* Transparent.—*Is there any reason why "translucent" is preferable here?* 1st. It is less commonplace, and hence free from the prosaic associations of "transparent;" 2nd. "translucent" draws attention rather to the medium itself that transmits the light, to its lustre, etc.; "transparent" to the fact that other objects are visible through it (See dictionary); evidently the former point is the important one in this connection.——*To what does "bathed" belong?* "Curtain."——*What is the exact force of "bathed?"* It draws attention to the fact that the curtain is immersed in light, *i.e.*, that the light is abundantly and everywhere present. ——*Is there anything actually in nature which corresponds to the "curtain of translucent dew?"* To the present writer it seems not; if this be the case, there is a defect here in the poem.

Line 6.—"Flame." *How is this word more effective than "sun?"* It suggests the glow and the bright clouds of sunset.

Line 7.—"Host." *What is the exact meaning of this word?*

Note its frequent use in the Bible, especially in connection with the word Heaven. (See Concordance to the Bible).

The attention of the senior pupils may be drawn to this poem as an exemplification of the sort of thing poetry is fitted to do; to express in melodious language an inspiring thought; to bring us into sympathy with an idea, to open the mind by putting us in the proper mood for its reception, rather than to prove it, to force it upon us by argument; to suggest, to set us thinking and feeling, rather than to state an idea definitely and completely.

The poem should be read aloud at the end of the lesson and the pupils may be asked, as a written exercise, to state in simple language of their own, its substantial meaning.

CHAPTER III.

LANGUAGE TRAINING.

THE best methods of training children in the art of using language with ease, accuracy and clearness, might be expressed in a few brief sentences, but the student of education, if only of method in education, needs to do much more than merely memorize a few rules for his guidance in directing the efforts of young children to develop their powers of expression. He needs to enquire what is really implied in the terms, *language* and *language training;* to distinguish between the art of language, and the study of language from the scientific point of view; to make a careful estimate of its educational importance; to consider the preparation on the part of the teacher required for the work of most effectively training young children in their mother tongue, and to study young children so as to understand the extent and character of their language preparation before entering school.

From the data gathered from the above named sources, he should be able to deduce some general principles for his guidance in the work, and to decide upon the chief means to be employed in the schoolroom to accomplish his purposes.

What is Implied in Language Training?—Language is the art of expressing thought. Considered broadly, this applies to all modes of expression, but in this connection we shall limit

ourselves to the consideration of expression by means of words. The cultivation of language power, therefore, includes all that tends to develop the art of using words in expressing ideas; all the instruction and practice which generate educated skill in verbal expression. This part of the subject falls into two divisions, oral and written expression. Written expression is treated as a separate subject, composition, so that we may again limit our view to oral expression of ideas. This clearly includes primarily the development of ideas or of mental power, and secondarily, a corresponding extension of vocabulary, and of power to use words appropriately, accuracy of pronunciation, correctness of syntax, clearness, force, beauty and fitness of figures; in other words all that goes to make language plain, potent and pleasing.

The art of language, its practical use as an instrument of thought-expression, must not be confused with the scientific study of language as grammar, philology, etc. One may be a master of the art of language who knows little or nothing of grammar and philology, that is of the scientific aspect of language; and similarly one may know more grammar than has yet been written, and not be able to speak or write either easily or correctly. The most skilful carpenter may know nothing of the chemistry and physics of the tools and materials he uses: he has acquired his skill through intelligent practice; similarly the champion athlete attains his power and skill by judicious exercise and not by studying anatomy and physiology. It is much the same in language. Skill comes only through

practice, but the more intelligence there is behind the practice the higher the degree of perfection attainable.

The Importance of Language Training—The importance of training in one's mother tongue may be clearly seen from three points of view:

1. *The relation between language and thought.*—It is often argued that thought and language are inseparable, and this is probably true enough from a practical point of view, but a careful study of the question must show that there may be rudimentary thought, without any form of verbal expression.* It should rather be said that without verbal language, thought must inevitably remain rudimentary, in other words, that the growth of language power conditions the growth of thought power. Thought is the sovereign and words his subjects. The power and range of influence of the sovereign depends upon the number and character of his subjects. New territory can only be discovered, explored, occupied and made a source of strength through the services of the subjects, guided by a strong and wise sovereign. Every new word added to a vocabulary and brought into proper active relations with the sovereign mind, becomes a re-inforcement to the whole.

Between thought and language there is also a mutual inter-dependence of character as well as of growth in power. A person who thinks clearly and forcefully is likely to speak in the same way, and one who seeks the clearest and strongest expression of his thoughts will find his thoughts

*Preyer's Mental Development of the Child, page 30, et seq.

become relatively clearer and stronger. On the other hand confusion in language is evidence of confusion in thought, beauty of language indicates beauty in ideas and conceptions.

2. *The utilitarian value of language, its importance as an instrument in the affairs of life.*—Through the three forms of verbal language, speech, reading and writing, we exchange thoughts and express our feelings and determinations. The more skilful one is in the use of language the more effective does he make the expression of his ideas, his emotions and his will. It is often remarked that it is not so much what one says as the way in which he says it, that seems to attract attention and exert influence. This is, doubtless, measurably true in every department of life where language is much used; in the councils of the nation, in the pulpit, at the editor's or the teacher's desk, in the institute, behind the counter, everywhere, *he* exerts most influence who, with thought power, has also cultivated the power of expression.

Then, too, cultivated language power is one of the simplest and most commonly read credentials of education and refinement. An ignorant man may present a good appearance and make a favorable impression, until his speech "bewrayeth him," by throwing off the disguise that wealth or mere social surroundings have enabled him to wear. But the common toiler rises higher in our respect and esteem the moment we find him skilled in the use of good language.

3. *Its national and racial importance.*—Through its effects upon the development of thought

and upon the personal influence and material prosperity of the individual language comes to have a national significance. It is certainly not a matter of mere chance coincidence that every great nation has developed a great language suited to its needs and its peculiar genius. There must be spontaneous activity in the individual and in the nation to give occasion for thought and desire for expression—there must be a measure of material prosperity to provide the time and opportunity for the cultivation of high thought and expression; but when these conditions exist they continually act and react one upon another. Therefore, if one would truly educate himself, if he would gain influence and win esteem among his fellows, if he would promote the higher life of his race he should strive to cultivate to the utmost his power to use the mother tongue.

Preparation of the Teacher—One's language is essentially a part of himself. It is not something that can be secured in a few days and put on like a new suit of clothes. It grows with him and fits him as closely as his skin, and like his skin, too, it can only be changed by growth through time, as the old is displaced by the new gradually developed within. If the conditions surrounding the teacher during childhood and youth have been favorable to the development of good habits of language he is fortunate and there may be little need of the displacing process; but if they have been unfavorable, as they frequently are, then he must make it a special purpose to continually seek the purest and most nutrient language food to promote a healthy growth within, and he must apply vigorous friction

of self-criticism to wear away the old scales of his bad language habits. It is most deplorable, and it seems largely inexcusable that so many teachers are continually repeating, in school and out, the most common and glaring examples of incorrect language. The reason appears to be that they have heard and used these incorrect forms so frequently in childhood that, in spite of better environments and more or less good reading, the habit remains, and the language sense is not shocked by forms of expression that to the cultured ear are exceedingly discordant.

Every true teacher should make it his ambition to do his part to remove this reproach, should saturate himself with good English, should invite his intimate friends to prove their friendship by frankly checking his errors, and when errors are discovered to be a part of his language habit, he should practice the correct form aloud until his ear will promptly and always remind him of that error.

But to know and use correct language is not sufficient, though it is the prime requisite. To be truly interested in the cultivation of language power, to be able to inspire a love for good language and a desire for improvement in that line of education, to be prepared to select reading matter that is most helpful both for himself and his pupils, one must have a feeling for English—a sensitive appreciation of the essential qualities of good language. This, and this alone, is "the spirit that giveth life" to all language teaching.

In everything that enters into the real being of the pupils, the teacher's example is more potent than his precept, and this is likely to be true of his

training in language. If his speech is clear, chaste, easy and beautiful, it will not fail to attract imitation.

Preparation by the Pupil—When we consider the child of five or six years entering school we find that he has already made marvellous progress in the cultivation of language power. In other words he has laid an educational foundation of two important elements.

First—He has acquired a large amount of knowledge relating to a wide range of subjects. The growth of mental power is already well established. The mind has such a store of working material, and has had such an amount of exercise, that it needs only favorable conditions to insure continued vigor of growth in power.

Second—He has a measure of language power that enables him to express his ideas, often crudely, it is true, but with simple directness and picturesqueness.

Between these two elements of his attainments there is necessarily a certain relation. While the knowledge will invariably be found in excess of the power of expression, it will also be found as a general rule that those children who have had best opportunities for acquiring new ideas, have also made most progress in the development of language power.

How has the little child, starting with nothing but potentiality, acquired so much knowledge and power? His education has been largely undirected and informal, but it has proceeded along natural lines. If a child were isolated he could not be educated, but through the medium of sense

perception there has been constant contact between the mind of the child and the material world about him. In an infinite variety of ways this has been an undesigned contact, the result of mere environment, but just as appropriate and effective in provoking mental activity. Then in thousands of ways the contact of mind with the outside world has been directed by parents, nurses, and companions.

The production of vocal sounds by the child is instinctive, but speech is an art acquired by imitation, and at every stage in the development of language power imitation is the master agent. The instinctive cooing and babbling of the baby gives vocal power and skill, so that after he has a few thousand times heard the word "Mama," and at the same times he has seen his mother's face, he learns to associate the name and the face and to babble "Mama." So he early learns the name of the dog, the cat, his food and drink, etc. When the idea of action comes to be associated with sounds little sentences are formed, as, "Papa tum."

Thus the processes go on. The world is all new and fresh and interesting to the little one, and everybody loves a little child, likes to show him what seems to be new and interesting and to talk with him about them, and likes to hear him try to express himself. Help, encouragement and guidance are ever at his side. The child delights to exercise his new power. He cannot understand why he should not tell about everything he sees and hears. Nay, more, his language power becomes a plaything to him and comes under the magic spell of his imagination, just as the knotted rag becomes a living baby, or the

little stick a horse. He manufactures the most wonderful stories, sometimes without a shadow of truth, often with nothing more. His parents are alarmed at his early depravity, and confirmed in the doctrine of inborn sin, in this case dating two or three centuries back. To the child at this stage these stories are no more lies than are the rag babies, the wooden swords or the mud pies.

As the child grows older and becomes more independent, the encouragement and help are gradually withdrawn, and there is little doubt that the rate of growth of both knowledge and expression steadily declines during elementary school life.

General Principles—From the foregoing considerations we are able to derive a few general fundamental principles to guide us in selecting materials and deciding upon the methods to be employed in carrying on the work of language training in the schools.

1. *There must be the most favorable conditions for stimulating thought.*—The spontaneous desire to express thought is an essential condition of the growth of language power, and with young children at least this desire is mainly induced by the acquisition of new ideas. The pupils should be continually occupied in forming clear notions of objects and subjects of study, and this should be followed by the opportunity of expressing these ideas with ease, clearness and accuracy.

There is a theory quite generally accepted among educators and others, that the great masters of English, oral or written, have nearly all had a thorough training in ancient classics. The reason

seems obvious. Apart from the influence of a knowledge of the sources of so much of our language, they have been thoroughly trained in English through the study of the classics. Where the teaching has been right the translation of every sentence has been an English language lesson. The student worries through the original, working out the thought as best he can. When the thought obtained is tolerably clear, the whole mind is concentrated in an effort to put that thought into the best possible English.

Applied to the teaching of other subjects this is precisely the principle we urge as fundamental in the training in English. Direct the study of the pupils in appropriate literature, in nature study, in form and number, etc.; when they have obtained new thoughts let them express them in the best English they can command. Where a series of thoughts are related they should find expression in more or less connected language. American schools have recently been flooded with language books, the main idea of which is to get pupils to use certain words in sentences, and consequently teachers and pupils have wasted much time and have grown disgusted with these so called "language lessons." Good teaching must ever be directed in evolving thought which naturally seeks expression. This is essentially the initial step in all language training.

2. *There should be good models.*—If the learner in his efforts to express thought has constantly before him good models of language, his practice will tend to clearness and correctness as well as ease. The ideal condition, of course, is that the child

should not hear or read any incorrect language, but, since, out of school, conditions frequently make this impossible, it is all the more important that teachers should make the school environment especially helpful.

The teacher's own language is the first model; and whether it be for good or for ill, depends upon its character. It has frequently been observed that some slight peculiarity of accent or pronunciation on the part of the teacher gradually permeates the whole school. Many other influences, though less easily detected, are equally felt. Besides exercising the utmost care in the cultivation of his own language, the attention paid to that of each child in the school comes to have a common reciprocal influence upon that of each of the others, whereas if inaccurate and clumsy expressions frequently pass uncorrected, the pupils using such become veritable stumbling blocks to all the other members of the school.

Then, too, the kind of matter read, especially if read several times, becomes a most potent factor in moulding the language of the child. From this point of view alone it is unfortunate that so many primary reading books are filled with poor commonplace sentences, designed especially for teaching the sounds of letters, and lacking all the elements of natural interest and literary merit. Instruction in the sounds of our letters is important and it will probably always have its place in the teaching of primary reading, but just now it has a great deal more than its own place. It is not everything in the first two years' reading, and it is already being

demonstrated that the sounds of the letters can be taught just as successfully through good appropriate literature as through the "crazy quilt" lessons made out of a collection of words phonetically related. The stories in the primary readers, the supplementary reading matter, the memory selections, the books read at home may all have a powerful influence upon the thought and language of the child and should therefore be the best he can read.

3. *There must be abundant opportunity for practice.*—In this connection as in many others, we have not gone far enough in the recognition of the law of education through the self-activity of the child. From no selfish motive, but from example, habit and a wrong idea of relative values, the average teacher does from three-fourths to nine-tenths of all the recognized talking in the class room, and leaves the other small fraction to be divided among forty or fifty pupils. The little child whose opportunities for cultivating speech under the guidance of the teacher are limited to a few stilted and unrelated answers to questions, cannot be expected to make much progress in the growth of language power. It were as reasonable to expect a child to develop a good physique on an occasional pinch of salt. It is quite true the teacher's time is limited and already more than occupied, but is it occupied most economically for the children in this matter of language training? If we admit the principle that there must be, not only abundant opportunity, but considerable encouragement to practise, is it possible that the utmost is being done to meet the requirements?

One of the greatest discouragements to progress in the growth of language power, is unsympathetic criticism. There must be criticism, or rather correction, but this may be done in such a way as either to help or to hinder. It hinders when it makes the learner self-conscious regarding his language. For example a father allowed his little boy thirty cents a week to use as he saw fit. Noticing that he was picking up some incorrect forms of speech, probably among his playmates, he announced that the boy should forfeit one cent for every error in language detected by his parents. At first the fines amounted to only five or six cents a week, but in a few weeks they increased to twenty or more, and in a short time amounted to more than the weekly allowance, and even the sentences that were not incorrect were frequently halting and unnatural. For ease in talking the mind must be at ease. Speech is fettered by self-consciousness.

4. *Language training must be intimately correlated with the other subjects of study.*—In most cases special lessons in language, that is, lessons whose chief aim is the use of certain words, are comparatively useless. This thought cannot be too strongly emphasized. If the study of natural objects and phenomena, of myths, legends, historical stories, biographical sketches, of literature, of form, color and number, does not stir the children with a desire to express thought, then all the teaching is fruitless and the teacher must look deeper for the cause of failure. Thought is not being stirred, the minds of the children are not active, and hence there is no real education. The special language lessons will

not, as a rule, in any measure supply the need or serve as a substitute.

If before deciding to teach a lesson teachers would compel themselves to answer clearly the questions, what is its purpose? how will the growth of a child be promoted by the proposed lesson? very many so-called language lessons would "fall back dead." The relation of language to thought renders it imperative that at every step in every stage the development of one should be accompanied by a corresponding development of the other.

The School Means of Language Training and How to Use Them—

1. *Conversations.*—One of the best means of bringing the home feeling to the little stranger in the school room is to lead him into conversation, and thus into self-forgetfulness. This is also one of the simplest and most natural means of training in language power. Lord Bacon has well said "Certain it is that whosoever hath his mind fraught with many thoughts, his wits and understanding do clarify and break up in communicating and discoursing with another; he tosseth his thoughts more easily, he marshaleth them more orderly; he seeth how they look when turned into words; finally he waxeth wiser than himself; and that more by an hour's discourse than by a day's meditation."

The subjects for these conversations may be as varied as the experiences of the children, and should be drawn from the incidents of the school room, the play ground, the observations of the children on the

way to and from school, and in their homes, the characters in story and biography, the informal lessons in manners and morals and whatever is at once interesting and wholesome. In these exercises the chief duty of the teacher is to encourage the reticent, to guide the line of conversation, and to kindly lead to better ways of saying things. When he goes beyond this to answer questions, give needed explanations, or correct misconceptions, his own language should be neither childish nor technical.

2. *Stories.*—Appropriate stories constitute one of the very best kinds of mental food for the young child. In the first place they stimulate interest, and the mere act of sustained interest in appropriate stories well told is excellent training in the habit of concentrated attention; this in turn has a strong influence upon the formation of the language habit, especially if the story is good enough to bear telling several times. If, however, the children are led to tell the story in the best way they can, the beneficial results in both thought and language culture are more than doubled. The plan recommended by some of the leading German educators of making regular, daily, systematic story-telling a part of the curriculum during the first two or three years seems to be based upon recognized psychological principles.

Every primary teacher should be a good story-teller. If the faculty is not natural it can be cultivated. In junior classes telling is vastly better than reading a story. When the children have acquired considerable power as readers, the distinctly

new words should be placed upon the blackboard and their meaning and pronunciation taught.

No one should be exempt from taking part in the reproduction of these stories, because those who need the exercise most will be likely to form habits of inattention if they get the idea that they may be excused from their part in reproducing the stories. In the early stages of school life it may be wise to let the best story-tellers do more of this work than the others because the backward ones may gain more by listening than by their own halting, blundering, discouraging efforts.

At first, questions may, if necessary, be asked to recall and connect the salient points of the story, but as soon as possible the reproduction should be given without question, hint or suggestion. At all stages care should be taken that the reproduction be as truthful as possible. Imagination has a true and beautiful place in child life, but it is not in the reproduction of a story.

It is said that when Lord Macaulay was a little boy his father made it a practice to tell him a story every night and to require the child to reproduce it as well as he could. Gradually the stories selected were longer and more substantial in character, and still later stories were read to him, or the boy read for himself, but always there had to be the reproduction aiming at fulness, accuracy, ease and clearness of expression. As the boy's powers grew the nature of the subjects was gradually changed, and biographies, historical sketches, essays and poems were dealt with in a similar way. Is it any wonder the man who had had such training became a master

of English, or that he could reproduce a book after a single reading?

3. *Object Lessons.*—As a source of new ideas there is nothing better for young children than the study of objects, especially natural objects, or what is now known as nature study; and it follows that what provokes new ideas also calls for new language. This study should lead to scrutinizing observation, hence to exact and definite ideas and these will seek expression in precise language. The old idea of object lessons as an opportunity for giving the child immense quantities of gathered information about all sorts of manufactured articles and foreign products has done much harm to this important phase of elementary education.

The true aim is the development of the child's powers through exercise upon these objects. Hence, again, the chief work of the teacher is to act as a guide, to stimulate and direct this self-activity of the child. This, of course, can best be done by careful questioning, and the teacher should, as a rule, do but little of the answering. Frequently what the pupils cannot answer to-day may well be left over till another day, to be taken home and discussed out of school. Sometimes a good mind-awakening question can be kept as a live issue for a week or more. Let the teacher direct, sustain and intensify the investigations, lead the pupils to discover the errors in their conclusions, but in every good way encourage them to tell what they observe and infer.

For this work pupils should be asked and encouraged to bring to the school suitable objects for

study, and every school should have a cabinet in which to place such as can be preserved.

4. *Pictures.*—Related to object lessons, especially when considered as a means of developing language power, is the study of pictures. These may be the pictures of animals or other objects used to give some idea of the things themselves, or they may be works of art, valuable for what they represent artistically. Next to the study of objects children like pictures, and this is a guarantee of interest and attention, and an additional reason for their use.

The best pictures available should be used. The style of drawing, the coloring, the acts represented, the motive of the artist, the dress and personal appearance of the persons shown, all form elements in that unconscious education we so often disregard.

For very elementary work the teacher, if she has the skill, may make suggestive sketches upon the blackboard or upon large sheets of paper, or lacking the skill to sketch, she may find large paper stencils a helpful substitute.

Be sure that all have a good view of the picture, then by carefully prepared questions lead the pupils to:

(1). Tell what is represented in the picture.

(2). Describe each prominent figure.

(3). Explain the relation of the different figures to one another, or to some central figure.

(4). Suggest a title for a story to be inferred from the picture.

(5). Compose an original story for which the picture would be a suitable illustration.

(6). Interpret the lesson of the picture.

5. *Reading and Literature Lessons.*—If the subject matter of the reading books be of the right character and be treated in the right way, these lessons should exert a great influence upon the development of the child's language power. In both thought and diction the matter should be somewhat above the learner that he may be constantly looking upward, reaching upward, and growing upward. The thoughts of the passage should be freely and fully discussed, and reproduced by the pupils. His power to express what he has read is the only true test of the pupil's grasp of the thought, and of his preparation for oral reading. It would be well if during the first two years there were much more of this reproduction test of the child's power to get thought through silent reading, and much less striving after oral reading before children have sufficient power of word recognition. Paraphrasing, of either prose or poetry, is an admirable exercise, and though the child's expression may fall far below the model studied, it will be continually influenced by it. While the questioning upon a passage goes into matters of detail, the reproduction should aim at connected fulness.

Henry Clay has left us this record: "I owe my success in life to one single fact, namely: At the age of twenty-seven I commenced, and continued for years, the process of daily reading and speaking upon the contents of some historical or scientific book. These off-hand efforts were made sometimes in a cornfield, at others in the forest, and not unfrequently in some distant barn, with the horse and the ox for my auditors. It is to this early

practice in the great art of all arts, that I am indebted for the primary and leading impulses that stimulated me forward, and shaped and moulded my whole subsequent destiny."

6. *Memorizing.*—The memorizing of some of the gems of literature in prose and poetry, not only fills the mind of the child with best thoughts of the world's highest thinkers, but furnishes strong, beautiful, perpetual elements in the unconscious development of language power.

Composition—In the discussion of oral language training what has been said about the importance of the work, the preparation on the part of the teacher and of the pupil, the fundamental principles involved and the means to be used, applies with equal force to training in written language. The training in speech should constitute a general preparation for the written work and in most, if not all, of the elementary composition oral discussions should precede and prepare for the written exercise. Meantime the two lines of training will more and more diverge and each will become a more or less distinct art involving special conditions and requirements.

For several reasons composition is usually considered a difficult art to teach.

First.—It is commonly thought that ability to write well is a special gift, akin to that of the musical composer, and doubtless the masters of the literary art are specially endowed, but it is probably equally true that most of these literary artists have realized their endowment only through much patient study and practice and by this means anyone may attain a fair degree of skill.

Second.—Comparatively few persons, in school or out, are willing to spend the necessary time and labor in thorough preparation of the subject matter of an essay, to say nothing of the necessity for persistent and painstaking practice in expressing their thoughts upon the prepared theme. Usually those who succeed in acquiring power and skill in any art are so fond of it that they enjoy the practice, but strong, patient purpose may take the place of, nay, may usually do much more than simple fondness for the art.

Third.—In large classes the task of revising pupils' exercises, seems to make it impossible to provide as much practice as is desirable. This will be dealt with under "marking exercises."

General Suggestions—

1. *Preliminary Work.*—Where it is found in a particular school, whether with primary or advanced pupils, that the necessary foundation in oral training has not been laid, at least some time should be taken to correct the omission. Written expression is more difficult than oral. and the early training should not impress the pupil as difficult.

2. *Interest.*—In written as in oral training there can be no genuine growth in language power without a spontaneous desire for expression arising from the acquisition of new ideas. It is therefore a prime essential that pupils should be stimulated to a lively interest in the subjects upon which they are expected to write. Without this the work will be a mere imposed task to be disposed of with the least possible effort; but where there is even a small measure of love for the work there will be at least a corresponding measure of art, and of growth in power.

3. *Choice of subjects.*—Much care should be exercised in the choice of subjects. The teacher should always decide for junior pupils and usually for the more advanced, but the tastes and state of preparation of the pupils should always be considered. One writes best upon those subjects with which he is most familiar, though a child is not likely to choose such subjects for himself. He will think it too commonplace until he has learned how much more easily he can write upon it, and how much more satisfactory he can make the result. For the elementary classes reproduction of stories and of the ideas developed in nature study will be found most interesting and helpful. In higher classes the regular subjects of study should furnish much interesting material.

4. *Planning the essay.*—There must be training in organizing one's ideas preparatory to written expression, that is, pupils must learn with what and how to begin, how to work up the most effective arrangement of the main ideas and finally how to conclude. This kind of training should lead to the formation of the habit of making outlines or skeleton plans before beginning to write, without which orderly and intelligent work seems impossible.

5. *The elements of composition.*—From the first it should be a constant aim to develop clear ideas of the elements of expression.

(a). The sentence, what it must, and what it may include; how its limits must be indicated.

(b). What constitutes a paragraph, the purpose in so dividing the essay, different ways of beginning and ending, and how paragraphs should be indicated.

Revision by the Pupils—When, through practice, pupils have gained considerable power and facility in composition and are able to criticise the syntax and rhetoric as well as the mechanical parts of their work, they should be led to improve their own essays by revising them two or three times before submitting them to the teacher for examination. Then after receiving the teacher's criticisms and suggestions they should try again as often as the interest can be kept up. In this way the pupil works constantly to excel his former self. He has the satisfaction of seeing his first crude production improve under his own effort. He becomes conscious of his own power. He works with care. The rules for punctuating and the laws of syntax become vital principles when he finds them necessary to the clear and complete expression of his thoughts.

Marking Pupils' Exercises—To do anything like justice to the criticism and marking of pupils' essays necessarily involves a large amount of arduous labor. How can this work be reduced, and how can the essential remainder be rendered most effective?

First.—It should be borne in mind that spelling, the use of capital letters, and ordinary punctuation are matters of habit. Errors in these can be in a very large measure prevented by careful attention to the formation of right habits at the beginning. To those who appreciate the importance of directing the activities of children in right lines and so forming right habits, it will be recognized as vastly easier to train pupils to avoid making mistakes than to afterwards correct errors that have become habitual. Those who neglect the

ounce of preventative are sure to need the pound of cure.

Second.—It is not always desirable that the learner's attention should be called to his written errors. This suggestion must be used with discretion; carried too far it contradicts the first. The power to write with ease can only come through much practice, and this is the prime condition of progress. Much correction by another is almost sure to discourage and repress the very spontaneity so essential to genuine self expression.

Third.—At as early a time as possible lead pupils to revise their own exercises before handing them in. As often as once a week one written exercise from each pupil should be examined with care and returned. But most schools should provide for daily practice in written work. In that case it will be sufficient to mark a part of the papers each day, giving special attention to the backward or careless pupils, but care should be taken that none feel neglected.

Fourth.—(i). For primary classes:—

(a). Mark exercises with colored ink or pencil.

(b). Strike out misspelled words and write correct forms plainly.

(c). Substitute capitals for small letters.

(d). Where the wrong form of a verb or other word is used mark *w.f.*

(e). Strike out sentences of bad construction.

(ii). For more advanced pupils:—

(a). Use marginal notes to characterize passages as good, bad; strong, weak; clear, muddled: etc.

(b). Do not locate definitely errors in punctuation,

capitalization, spelling, grammar, rhetoric, etc., but indicate in the margin by such symbols as p, c, s, g, r, and require pupils to correct.

(c). The attention of the whole class may be called to prevailing errors.

(d). Sentences and paragraphs illustrating the contrasts referred to in (a) should sometimes be placed upon the board and pupils led to note the difference.

(e). When an exercise has been found imperfect in even a few minor points it should be re-written.

(f). By noting from time to time the common examples in false syntax the teacher will collect valuable material for training in correct idioms.

CHAPTER IV.

ENGLISH GRAMMAR.

In order to discuss the value of English Grammar as a school study, it will be well at the outset to understand its scope and object. It has been defined as "the act of speaking and writing the English language with propriety." "But for good reasons this traditionary view has, by competent scholars, been rejected as false." Dr. Fitch says, that whoever tries to teach or learn grammar as an art is doomed to disappointment. Prof. Whitney writes in these terms: "that the leading object of the study of English grammar is to teach the correct use of English, is, in my view, an error, and one which is gradually becoming removed, giving way to the sounder opinion that grammar is the reflective study of language for a variety of purposes, of which correctness in writing is only one and a secondary or subordinate one."

"The traditionary English grammar," says Hinsdale, "was created not by an original enquiry concerning the nature of the English language, but by imitating Latin Grammar." The wide dissimilarity between the structure of the English language and that of the Latin renders any application of the grammar of the one to the other almost useless, hence the failure in the past to obtain good results from this branch of instruction. And so great has been the disappointment of teachers in not realizing the

practical end as embodied in the old definition, that they now call for the abolition of the subject from the curriculum of school studies. But such demands proceed from a grave misconception of the sphere of the subject.

English Grammar is not the *art* of writing the English language with propriety; it is not an art at all. "It is a *science* and as such it was considered by the ancient Greeks." It is the science of language, and since the unit of thought is the sentence, it may be defined as the science of the sentence. As such it is limited to "Etymology, or the doctrine of words, and to Syntax, or the doctrine of sentences."

Having determined its nature and field let us examine its value as a study. The study of grammar has a high *disciplinary* value, besides having a *practical* value strong enough of itself to ensure its continuance on the curriculum of school work.

Disciplinary Value—1. Grammar deals with the analysis of words and sentences, with a view to their being arranged into classes on the basis of similarity in relation. "This involves the analytico-synthetic or inductive exercise of mind. In this process there is obviously a peculiar training of the powers of observation, working not only upon the forms of words, idioms and sentences, but upon the realities behind them, verbal distinctions, meanings and relations."

2. There is also involved a vigorous exercise of the logical powers—analysis, comparison, abstraction and inference. "Intellectual processes are developed by studying the relations of objects external and

internal. From an educational standpoint the study of the latter is much more important than that of the former." It is only when the mind disregards the sensuous elements of presentations and grasps the deeper abstract relationships that it is introduced to the sphere of scientific thinking. Now grammar deals with the relations of thoughts and ideas as expressed in the sentence, the comprehension of which can result only from the student's performing the mental processes carried on by the originator of the thought. This work on the part of the student is rendered the more necessary in English by the fact that its language is uninflected; "the words do not, as in Latin (by their forms), serve as guideposts to indicate the thought." "But, since thought relations in English are largely dependent upon the position of the words and the spirit of the passage as compared with the more mechanical languages, its grammar is peculiarly valuable as a discipline." On this Prof. Greene makes this very pertinent statement:—As a sentence is the expression of a thought, and as the elements of a sentence are expressions for the elements of thought, *the pupil who is taught to separate a sentence into its elements is learning to analyse thought, and consequently to think.*

3. The intellectual discipline afforded by the study of grammar bears, in common with all other studies when rightly conducted, *indirectly upon moral discipline.* On this Prof. Laurie remarks, "moral discipline is the habituating of the will, the dominant function in a human being, to overcome the difficulties of a temptation to stray from what is

seen and affirmed to be the right path. But it is the same will which I call upon for energizing activity when I present the mind of a boy with the intellectual difficulties of formal studies and call upon him to overcome these. There are not two wills in man. The effort, then, which all formal studies demand of the young that they may overcome intellectual difficulties is not merely intellectual but moral, in its effects on character."

Value for Practical Use—1st. It enables the pupil to apprehend with greater precision, the meaning of what he reads. The student who has, through the use of examples, thoroughly grasped the logical relations of the elements of a sentence possesses the power to interpret not only short sentences whose order, for metrical or other reasons, has been changed, but also long and intricate sentences, whose difficulty consists in their complexity.

2nd. It enables a pupil to express, with greater intelligibility, his own experiences and thoughts. Thought and language are so interdependent that after a certain well-marked stage, an advance in the one is necessarily accompanied by a corresponding progress in the other. So that any training that enables the pupil to analyse thought, and therefore to think, must indirectly assist him in his composition.

What Herbert Spencer writes concerning Rhetoric is applicable to Grammar. "Some practical result may be expected from a familiarity with principles; the endeavor to conform with laws will tell, though slowly; and if in no other way, yet as facilitating

revision, a knowledge of the thing to be achieved,—a clear knowledge of what is accuracy and what is inaccuracy cannot fail to be of service."

When to be Taught—It is a fundamental principle in Pedagogy that subject matter and method should be accommodated to the condition of the pupil's mind. To present to a child a subject that calls for the exercise of mental powers not yet developed, is not only useless but positively harmful. The study of Grammar demands the exercise of a highly analytic function with which a child in the formative language period is unable to respond. Grammar study therefore, should be postponed until the growing powers of the child enable him to apprehend the relations involved in the sentence and the functions of its component elements. This will defer the study of grammar to the fifth school year, or to speak in terms of our grade system, the Senior Third Book grade.

It is advisable, however, at an earlier period, to direct the attention of the pupils to the essentials of a sentence, subject and predicate, for the purpose of correcting errors in their sentence composition.

What to be Taught—After teaching the essential elements of the sentence, there will follow regular exercise in the more minute analysis of language—the classification of words composing the sentence. The following order is suggestive :—

A. Units of the sentence.

1. Essential elements ; verb, noun.
2. Modifiers ; adjective, adverb.
3. Unit equivalents; pronoun, phrase, clause.
4. Connectives ; preposition, conjunction.

B. Comparison and classification of the syntactical relations existing between the sentence units.

C. Sentence forms and values.

D. Subclassification of parts of speech.

E. Inflection; general study of the purpose of inflection as exhibited in the parts of speech followed by detailed study under each part of speech. The following order is suggested :—

1. Number in noun, pronoun, verb.
2. Gender in noun, pronoun.
3. Case in noun, pronoun.
4. Tense in verb.
5. Person in pronoun, verb.
6. Comparison in adjective, adverb.
7. Mood in verb.

Method—In all departments of instruction the end determines the means employed for its accomplishment. The chief end in teaching grammar is discipline rather than knowledge, the development of mental power rather than the acquiring of language facts. Exercise is the law of growth; development of mental power is conditioned upon the exercise of the activities involved. Grammar deals with the principles underlying the use of language. These principles are broad generalizations induced from the careful observation of the particulars and facts of language. To be of value as a discipline, the pupils must be led to analyse these facts and make the inductions for themselves. By this means observation is quickened, and a scientific trend given to the pupil's thought.

No text book should be used by the pupils before the seventh school year, that is the Senior IV grade;

and even here there is no absolute necessity for its use. Suitable passages from the reader, methodically arranged, are superior to isolated examples from a text book. Where a text is used, the greatest care must be exercised that the pupils do not cease original investigation to accept the ready made definitions and principles of the Grammar author.

A few remarks will now be added dealing more particularly with method in relation to the subdivisions of the preceding section. Division A comprises the general classification and definition of the sentence elements. The basis of this classification and definition is *function*, and not *form*. To determine the class to which a word belongs will require the pupil to study the meaning of the sentence that the part contributed by each word to the upbuilding of this meaning will be clearly apprehended. From several sentences the words performing similar functions are selected, and, on the basis of this similarity, grouped together and a common designation assigned to them. The method here employed is evidently the *inductive*.

No apology need be offered for the position of phrase and clause in A. All the functions possible to these elements have previously been studied in noun, verb, adjective and adverb. And since function, not form or structure, here, is the guiding principle, a knowledge of the conjunction and preposition may be postponed until these unit equivalents have been studied at least in a general way.

The method in B is similar to that employed in A. To some extent it is a review of A, but differs

from it in being more abstract. It serves as a summary to the preceding work, being a generalization of the relations involved among the classified elements. Exercise of this kind affords rare training of the power of analysis, and enables the pupil, quickly and correctly, to assign to any unit its logical value in the sentence.

In C, we have classification of sentences. The basis of this grouping is *form* or *composition*. The pupil is here introduced to the study of the more complex units of thought; but having already studied the logical values of clauses, this exercise will present no difficulty.

D introduces the subclassification of the parts of speech. The mental activities employed in this exercise are similar to those used in A; but the basis of this classification is different. While in the former it is *function*, in this it is *significance*, or *relation*, according as the words to be classified are notional or relational. On the basis of *significance* will be classified, nouns, verbs, adjectives and adverbs; on the basis of *relation*, pronouns, prepositions and conjunctions. Upon the accuracy of the classification and the precision of the definition of the classes, will depend the value of this department of grammar. No thoughtless work may be allowed and the very common habit of inducing generalizations from too few particulars must be carefully guarded against.

Inflection is another subject that demands thoughtful treatment. Nice discrimination of the meanings and uses of inflected forms and their substitutes conduces to clearness of style, while the

study of these differences affords the student a very profitable mental exercise. Inflection marks function and general signification. When pupils have learned through practice to distinguish these, they are in a position to study the changes of form dependent thereon. In the sequence in grammar, therefore, inflection should follow the definitions. Since inflection engages the mind in activities similar to those employed in classification and definition, it should be taught, as they, inductively.

Limited space restricts the writer to the few type lessons which follow. These, however, illustrate in detail all the principles above outlined.

Subject and Predicate

Introduction.

1. Ask the pupils to name objects in the room, such as desk, bell, cup.

2. Ask them to make statements about each of these objects.

Development.

1. Write one of these statements on blackboard.

The bell rings.

2. Ask the class to read the words that stand for that about which the statement is made.

3. Underline this part.

4. Ask pupils to read the part used to state something about the bell.

5. Doubly underline this part: *The bell* RINGS.

6. What is the use of the first part of this statement?

Ans.—It names the thing about which the statement is made.

What is the use of the second part of this statement?

Ans.—It is used to state something about the thing named in the first part.

7. Ask the pupils for other statements about persons or things, and write them on blackboard as they are given. Then require the class, in answer to questions as above, to read each of the two parts into which each statement is divided, and give its use.

8. The technical terms, subject and predicate, are now given to the pupils by telling them that the part of a statement used to name the thing about which the statement is made is called the subject, and that the part of a statement used to state something about the thing named in the subject is called the predicate.

9. The pupils will now be asked to give the subject and predicate of each of the statements on the blackboard.

10. The pupils will now be led to form simple definitions of subject and predicate, based on the characteristic function of each. These definitions are written on blackboard, and pupils drilled on them.

Practical Exercises.

1. Statements are written on the blackboard and pupils are required to name and underline the subject and predicate of each.

2. Statements given orally are divided into subject and predicate.

3. Pupils compose statements and analyse them as above.

The Noun

Introduction.

1. Present an object to the pupils and ask them to name it. Write the name on the blackboard. Make use of other objects in the same way and thus lead the pupils to distinguish an object from the word used to name it.

2. Drill on the use of words.

Development.

1. Ask the class to give the names of persons, places and things, and as they are given write them on the blackboard, as,—

Mary,	Hamilton,	ball,
Tom,	Toronto,	lamp,
Henry,	Oakville,	chalk,
John,	Lindsay,	window.

2. Ask the class to make statements about each of these, as,—

Mary sings. The ball rolls.
Tom runs. The lamp gives light.
Henry walked home. The chalk makes dust.
Hamilton is a city.
Toronto has many people.
Oakville is on Lake Ontario.

3. What are these (pointing to the words) we have written on the blackboard?

Ans.—Words.

What is the use of the word "Mary" in the first statement?

Ans.—It is used as the name of a person.

What is the use of the word "Tom," "Henry," etc.?

4. In what are these words alike?

Ans.—They are the names of persons.

What is the use of the word "ball" in the fourth sentence?

Ans.—It is used as the name of a thing.

By similar questions lead pupils to state the uses of the words, "lamp," "chalk," "Hamilton," "Toronto," etc.

NAMES

Names of persons.	*Names of places.*	*Names of things.*
Mary,	Hamilton,	ball,
Tom,	Toronto,	chalk,
Henry,	Oakville,	lamp.

4. In what are all these words alike?

Ans.—They are words used as names.

Technical Terms.

The pupils are now told that words used as names are called Nouns.

Definition.

After the pupils have been familiarized with the use of the term through pointing out and naming the Nouns in the sentences written, they are now asked to frame a simple definition of a Noun, founded on its prominent characteristic as presented. A Noun is a word in a sentence used as a name.

Practical Exercises.

1. Write sentences on the blackboard and have classes select all the Nouns.

2. Require pupils to name the Nouns in statements of their own composition.

3. Require pupils to select and write out the Nouns from sentences in the Reader.

The Verb

Introduction.

1. Ask class to make sentences using such subjects as "the sun," "John," "the slate," etc.

2. As these are given have pupils analyse them into subject and predicate.

Development.

1. Into what two parts may every sentence be divided?

2. Do the words "the sun" form a sentence?

Ans.—No.

What leads you to think they do not?

Ans.—They do not contain a predicate.

3. By using an additional word form a sentence with them.

Ans.—The sun shines.

4. In this sentence what is stated about the sun? What is the word particularly used to do this?

Ans.—"Shines."

5. Make statements from the following by adding words as above.

The cat . . . .
The dog . . . .
The boy . . . .
The large book . . . . on the floor.
The teacher . . . . at his desk.

Ans.—The cat jumps.
The dog barks.
The boy laughs.
The large book is on the floor.
The teacher stands at his desk.

6. What words have been added ?

Ans.—"Jumps," "barks," "laughs," "is" and "stands."

7. How did the addition of these words affect the original groups of words ?

Ans.—They made statements of them.

8. Then in what respect are the words, "jumps," "barks," "laughs," "is" and "stands" alike ?

Ans.—They make statements when added to the words which, of themselves, do not make statements.

Technical Term.

Words, used as these, are called Verbs.

Definition.

The pupils are now called on to give a simple definition of a Verb, as: A Verb is a word used in a sentence to state something.

Exercises.

1. The pupils are asked to name and underline the Verbs in sentences on the blackboard.

2. Pupils give sentences on various subjects and name the Verb in each case.

3. Pupils point out the Verbs in sentences in the Reader.

The Adjective

Introduction.

1. Briefly review the noun emphasizing the distinction between the thing and its name as in a former lesson.

2. Ask for examples of nouns.

Development.

Write on the blackboard sentences such as the following:

1. Desks are in schools.
2. Books are on shelves.
3. Bees live in hives.
4. Children enjoy summer.

What desks are named in the first sentence?

Ans.—No particular kind; any kind.

What schools are named in first sentence?

Ans.—Any schools.

To what books and shelves will the names "books" and "shelves" of second sentence apply?

Ans.—To any books and shelves.

Similar questions will be put concerning "bees," "hives," "children," and "summer," of sentences 3 and 4.

3. In what respect are the nouns "desk," "schools," "books," "shelves," "bees," "hives," "children" and "summer" alike?

Ans.—They are names that will apply to any object or objects in the world of that name.

Single desks are in Hamilton schools.
Large books are on deep shelves.
Tame bees live in wooden hives.
Canadian children enjoy Indian summer.

4. To what does the word "desks" apply when we say "single desks"?

Ans.—To those desks only at which one pupil sits.

To what does the word "schools" apply when we say "Hamilton schools?"

Ans.—To only those schools situated in Hamilton.

Similar questions are put concerning "books," "shelves," "bees," "hives," "children" and "summer," as used in second set of sentences.

5. The pupils are now led through comparing the meaning of the names "desks," "schools," etc., of 1st set, with the meaning of the same names in the second set, to see that the application of the names is lessened or limited in second group.

6. Read the words used above to limit the application of "desks," "schools," "books," "shelves," "bees," "hives," "children" and "summer."

Ans.—"Single," "Hamilton," "large," "deep," "tame," "wooden," "Canadian" and "Indian."

7. What then is the use here of the words "single," "Hamilton," "large," etc.?

Ans.—The words are used to limit the application of nouns.

This answer is written on the blackboard.

8. In the sentence, "Many soldiers are killed in battle every year," name the words that are used to limit the application of a noun.

Ans.—"Many" and "every."

Suppose we say: "All soldiers are killed in battle every year." How is the application of the noun "soldiers" affected?

Ans.—It is enlarged or extended.

What word does this?

Ans.—"All."

The same effect may be shown in the case of "every."

9. What is the use of the words "all" and "every?"

Ans.—These words are used to enlarge or extend the application of the nouns "soldiers" and "year." This is now written on the blackboard.

10. The teacher now explains to the class that when the application of a noun is limited or extended we say that its application is modified.

11. Read from these sentences every word used to modify a noun.

Small trees sometimes grow large apples.
Tall trees from little acorns grow.
Mary's mother was a clever woman.
Every pupil should do good work at all times.

Technical Term.

A word that modifies the application of a noun is an Adjective.

Exercises.

1. Name all the Adjectives used in the sentences in this lesson and name the nouns modified in each case.

2. The pupils are required to form sentences on various subjects named by the teacher, using Adjectives.

3. The pupils point out the Adjectives in sentences from the Reader, and name the nouns they modify.

Note.—The following blackboard work will facilitate the generalization in above lesson, while at the same time it summarizes the pupils' conclusions at each step.

Adjectives. | Noun Modifiers. {
1. Words used to limit the application of a noun. "Single," "Hamilton," "large," "deep," "tame," "wooden," "Canadian," "Indian."
2. Words used to extend the application of a noun. "All," "every."

The Adverb

Note.—To develop the conception of an adverb as a word used to modify a verb, adjective or other adverb, will require at least three lessons. The first should show its function as modifying the application of a verb; the second, its function as modifying the application of an adjective; and the third, its function as modifying the application of an adverb. Only the first lesson will be outlined here.

Introduction.

Ask class for sentences on given subjects, in which adjectives will be used. Question them on the use of these adjectives.

Development.

1. Write sentences on the blackboard as:—

The little girls sew neatly.
The young lady sings sweetly.
The postman comes often.
The sun shines brightly to-day.
The white snow falls silently.

2. Separate each of above into subject and predicate.

Name all the adjectives used in these sentences.

3. What is the use of the adjective "little," in sentence 1?

Ans.—It modifies the application of noun "girls."

What is the use of the adjectives "young" and "white?"

4. Name the verb in first sentence.

What action is expressed by this verb?

What are we told concerning this action of the girls?

Ans.—It is said that the action of sewing is done neatly.

What word is here used to show this?

Ans.—"Neatly."

What is the use of the word "neatly?"

Ans.—It is used to show how the action is performed.

Suppose the sentence read "The little girls sew." What might this mean concerning the sewing?

Ans.—It might mean that they sew *well*, or *poorly*, or *anyway*.

But in the sentence as written, what is the application of the action sewing?

Ans.—It applies to neat sewing.

What is it that effects this change in the application of "sewing."

Ans.—The word "neatly."

What then is the use of this word "neatly?"

Ans.—It modifies or changes the application of the verb "sew."

5. Similar questions are asked concerning the use of the words "sweetly," "often," "to-day" and "silently," of succeeding sentences, leading pupils to the conclusion that these words are used to modify the application of the verbs in their respective sentences.

6. In what respect are these words "neatly," "sweetly," "often," "to-day" and "silently," alike.

Ans.—They all modify the application of verbs.

Technical Term.

The pupils are now told that words used to modify the application of verbs are called Adverbs.

Exercises.

1. Other sentences are given orally or written on the blackboard, and pupils are asked to name the Adverbs and state their uses.

2. The pupils are given unfinished sentences and are required to supply Adverbs.

3. Pupils are required to name Adverbs from sentences in Reader and explain their function.

The Pronoun

Introduction.

Place sentences on the blackboard and call upon the class to point out the nouns and state their function.

Development.

1. Ask a pupil of the class to perform an action involving another pupil, e.g.,

Ask John to lend James his knife.

Now call upon a pupil to state what has been done.

Ans.—John lent James a knife.

John, you state what you did.

Ans.—I lent him a knife.

2. Write these sentences on the blackboard :

1. John lent James a knife.
2. I lent him a knife.

What is the action expressed in sentence 1 ?

Ans.—Lending a knife.

Who performed the action ?

Ans.—John.

How did John state this action performed by him ?

Ans.—I lent, etc.

To whom did he refer when he said I ?

Ans.—To John.

What word might he have used instead of "I ?"

Ans.—The word John.

What part of speech is John ?

Ans.—It is a noun.

Then "I" is used instead of what part of speech ?

3. Similarly treat the word "him" of second sentence.

4. Ask James to state what was done.

Ans.—He lent me a knife.

Deal with the words "he" and "me" of this sentence as with similar words above.

5. After these and other similar words are dealt with and the pupils well drilled on their function, the class will be asked to state in what particular these words are alike. Each is used in a sentence to take the place of a noun.

Technical Term.

The class is now told that each of these words is called a Pronoun.

Definition.

The pupils are now asked to frame a simple definition of a Pronoun based on the common characteristic observed in the words studied.

Exercises.

1. Sentences are given orally or are written on the blackboard, and pupils are asked to substitute Pronouns where possible.

2. Skeleton sentences are written and pupils are required to fill out with Pronouns.

3. Pupils point out the Pronouns found in sentences in Reader.

The Phrase

Introduction.

Review through sentences on the blackboard the functions of words and their speechpartship.

Development.

1. Write such a sentence on the blackboard as:—

He sprang hastily from his grassy couch.

Question to bring out the function of "hastily" and of "grassy."

What is the subject of this statement?

What action is asserted of this subject?

Ans.—The action of springing.

What is the use of the word "hastily?"

Ans.—It is used to show how the action was performed.

(It limits the application of the word "sprang.")

What part of speech is the word "hastily?"

Ans.—It is an adverb.

See if you can express the idea contained in "hastily" in another way. If pupils cannot the teacher will express it as:—

He sprang in haste, etc.

What expression have we used instead of "hastily?"

Ans.—"In haste."

What is the use of the words "in haste" as used here?

Ans.—They are used to show how the action was performed.

To what single word is this group of words "in haste" equivalent?

What part of speech is hastily?

Then to what part of speech is this group of words equivalent?

Ans.—An adverb.

2. Deal similarly with the word "grassy" leading the pupils to see that the words "of grass" do duty for or are equivalent to the single word "grassy."

He sprang in haste from his couch of grass.

3. Now place on the blackboard such sentences as:

The house *on yonder hill* is sold.
The boy ran *to his home.*
My door opens *to the child of want.*

Question concerning the function of each of underlined expressions, drawing from pupils that they are respectively equivalent to a single part of speech.

4. Ask the class to read the expressions,

"in haste."
"of grass."
"on yonder hill."
"to his home."
"to the child."
"of want."

Let pupils test these as to whether they are statements.

The fact that not one of these expressions is a statement will be discovered and the reason given, that none of these contain a subject and predicate.

5. Now lead the pupils to gather together the

facts learned, the points in which all these expressions are alike.

These will be written on the blackboard as obtained,

1. Each is a group of words.
2. Each does not contain a subject and predicate.
3. Each is equivalent to a single part of speech.

Technical Term.

The class is now informed that a group of words not containing a subject and predicate and equivalent to a single part of speech is called a Phrase.

Definition.

The pupils will now define a Phrase and this definition will be written on the blackboard and class drilled on it.

Exercises.

1. Sentences involving Phrases will be given and pupils asked to name them and give their functions.

2. Skeleton sentences given with blanks to be filled in with Phrases.

3. Phrases in text of readers to be named and functions given.

Note.—This should be followed by a lesson on classification of Phrases on the basis of function.

The Clause

Introduction.

From sentences written on the blackboard review word functions.

Development.

1. Teacher writes on the blackboard such a sentence as,

A feeble man cannot carry a heavy load.

What is the subject?

What is the use of the word "feeble?"

Ans.—It is used to show the kind of man.

What part of speech is feeble?

Now express the idea contained in "feeble" by the use of several words as, A man *who is feeble*, etc.

What words are here used instead of the word "feeble?"

If then this group of words exactly expresses the meaning of "feeble," to what part of speech must it be equivalent?

It must be equivalent to an adjective.

2. Other examples are written on the blackboard as,—

(1). The place where they lived knows them no more.

(2). They trimmed their lamps as the sun went down.

(3). The man who was sick is now well.

(4). He said that you told him.

(5). That he did it is not true.

What is the subject of the first sentence?

What is the use of "when they lived?"

Ans.—It is used to limit "place."

What part of speech is "place?"

Ans.—It is a noun.

To what part of speech then must "when they lived" be equivalent?

Ans.—To an adjective.

3. The other examples will be similarly dealt with, and the expressions under consideration written on the blackboard as,—

"Who is feeble."
"Where they lived."
"As the sun went down."
"Who was sick."
"That you told him."
"That he did it."

4. By questions the class is led to see that each of above collections of words contains both a subject and predicate.

5. At the dictation of the class the facts thus learned will be written on the blackboard as,

1. Each is a group of words.
2. Each contains both a subject and a predicate.
3. Each is equivalent to a single part of speech.

Definition and examples will follow as in former places.

The Preposition

Introduction.

Develop the notion of relation by placing a book or other object in different positions relative to the desk. Require the pupils to express these relations between the book and the desk by means of sentences.

Development.

Teacher writes such sentences on the blackboard as the following:

1. The book lies on the desk.
2. The book is held under the desk.

3. The box rests on the table.
4. The boy lives in the city.
5. The girl in the school is wanted.
6. John is proficient in his studies.
7. The boy ran into the house.
8. The child ran to her.

1. Where does the book lie? What word here expresses the relation between the table and the lying of the book?

Ans.—The word "on." Read sentence 2.

Where is the book represented as being held? What word here expresses the relation between the desk and the holding of the book?

Ans.—The word "under."

Similar questions will be asked concerning the relations expressed by "on," "in," "into" and "to," in the other sentences.

2. Next, through questions, lead the class to see that each relation word joins or attaches a noun or its equivalent to some other word in the sentence.

3. Ask the pupils to state the facts thus far learned about these words; and as these are given tabulate them on the blackboard thus,

Relation words. { 1. Each joins a noun or its equivalent to some other word in the sentence.
2. Each shows the relation between the notions expressed by these words.

Technical Term.

The class is now told that such relation words are called Prepositions.

Definition and Practical Exercises.

The class should now be required to frame a definition based upon the common characteristics discovered in the Prepositions studied.

This definition will be written on the blackboard. Practical exercises will follow as in other plans.

The Conjunction

Introduction.

Review the sentence. Lead the pupils to understand the use of the terms "connecting" and "joining" by reference to the cars of a train.

Development.

1. Write such sentences on the blackboard as,

John came to school.
Mary came to school.

The pupils are asked to read them and finally to express these two thoughts in a shorter way, as:—

John and Mary came to school.

2. Call the attention of the pupils to the way in which this change has been brought about, viz., by joining the nouns "John" and "Mary" by the word "and."

3. Other examples of a similar nature are given and pupils are asked to combine the nouns as above.

4. The attention of the class is directed to the function of the word "and."

5. Other examples of a similar nature are given and pupils are asked to combine them by use of the words "and," "or."

6. The joining words used in these examples are named and their common function in the sentence stated by the pupils. This is written on the blackboard.

The words "and" and "or" are used to join words.

7. Sentences are now written on the blackboard, as,

Willie was present in the morning.
James was absent.
John attended the exhibition in Toronto.
Henry did not attend.
He was too busy.

The pupils are asked to combine them.

Their attention is now drawn to the words by which they have made the combinations and to the fact that they have joined together statements.

8. After a number of other examples have been treated as those above, the class will be led to state in what these words are alike. They are used to join statements.

Technical Term.

Pupils are told that words used to join together words or statements are called Conjunctions.

Definition and exercises as in other plans will follow.

Proper and Common Nouns

Introduction.

Review the noun, securing examples from the pupils.

Development.

1. Let pupils give, in sentences, nouns as names

of things, places, persons and animals, such as boy, Harry, iron, man, city, John, Hamilton, Mary, map, salt, Europe, knife, Toronto, Canada, money, chalk.

2. Suppose I express the desire, that a boy shut the door, who would perform the act? In this way lead pupils to see that the noun "boy" denotes any boy.

3. How does the word "Harry" differ from the word "boy" in application?

Ans.—Harry refers to a particular boy, while "boy" refers to any boy.

What name do we use to designate a number of things of the same sort placed together.

Ans.—A group or class.

4. Let pupils name all the nouns in sentences above, used like "boy" to denote a class or group, also those used like "John" to denote a particular individual.

The teacher writes these in columns as they are given by pupils as follows:

Class Names.	*Individual or Particular Names.*
boy,	Harry,
iron,	John,
man,	Hamilton,
city,	Mary,
map,	Europe.

5. In what respect are the words in first column (as used in above sentences) alike?

Ans.—1. They are names.

2. They are the names of classes.

Technical Terms.

The teacher now tells the class that a noun used as the name of a class of objects is called a Common (class) Noun.

The pupils are led to generalize from second column, as in 5 above. The teacher then gives them the term "Proper Noun" as applicable to the names in this column.

Definitions.

The pupils are now asked to frame a simple definition of a Common and of a Proper noun. These may be written on the blackboard, and pupils drilled.

Exercises.

1. Ask pupils for examples in sentences of Common nouns; of Proper nouns.

2. Let pupils classify the nouns found in lessons in Reader.

*Transitive and Intransitive Verbs

Introduction.

Review the function of the Verb.

Development.

1. Write such sentences on blackboard as:—

The boy hit his brother.
John made a kite.
James sent a letter to his mother.
Mary mended her dress.
Bears eat berries.

*The author is indebted to Principal Manning, of Hamilton, for suggestions on this plan.

2. Name the verb in each sentence.

Name the subject of each of these verbs.

What is asserted of "boy" in first sentence?

Name the action.

What would be the effect of closing this sentence with the word "hit," as "The boy hit . . . . ."

Ans.—The sense would not be complete.

What then completes the sense of these words in first sentence?

Ans.—The words "his brother."

Against what is the action of striking directed in first sentence?

(Who or what receives the action of striking?)

In what relation does "boy" stand to "striking?"

Ans.—"Boy" represents the doer of the action.

In what relation does "brother" stand to "striking?"

Ans.—"Brother" represents the one that receives the action of striking (the one against whom the action is directed).

3. Deal similarly with the verbs, subjects, and objects in remaining sentences.

4. What have we learned concerning these verbs? The answers should be tabulated as follows:—

1. Each verb (as used here) is incomplete.
2. Each verb represents an action as passing over from the subject or doer to some one or something as receiver.

5. Now let pupils contrast the verb uses in such sentences as:—

The man fell.
The woman faints.
The boy sings, etc.

with the verb uses in sentences above.

The pupils are led to see that the verbs here do not represent actions as directed against any person or thing.

Technical Terms.

The pupils are now informed that verbs of the first class are called Transitive (action passing over), and that verbs of second class are called Intransitive (not transitive).

They should also be told that the noun or its equivalent representing that against which the action is directed is called the object (something in the way of the action) of the verb.

Definitions and exercises as in other plans.

Classification of Adverbs

Introduction.

Through sentences on the blackboard review the function of the adverb.

Development.

The teacher writes sentences on the blackboard, as :—

1. The book was placed there.
2. James ran forward.
3. The man lives here.
4. The house stands yonder.

2. Name the verb in each of these sentences.

What is the use of the word "there" in first sentence ?

Ans.—It is used to indicate where the book was placed.

To what word is it related ?

To what class of words does it belong ?

What is the use of "here," "forward," "yonder." What part of speech is each?

3. In what respect are all these adverbs alike?

Ans.—They all indicate *place.*

Technical Term.

The teacher informs the class that such adverbs are called adverbs of *place.*

Development.

1. Teacher writes such sentences on the blackboard as:—

1. The boy returned then.
2. He lived there formerly.
3. She seldom visits them.
4. They always use it.
5. They often play.

2. By means of questions pupils will be led to name the actions or states expressed by the verbs, also to give the uses of the adverbs "then," "formerly," "seldom," "always" and "often."

3. In what respect are these adverbs alike?

Ans.—They all express *time.*

Technical term is now given as in case of adverbs of place.

Third and fourth development:—

Deal similarly with adverbs of *manner* and of *degree.*

Definition of each class and exercises as in other plans.

*Relative Pronoun

Note.—The plan presupposes a knowledge on the part of the pupils of the parts of speech with their

*The author is indebted to S. A. Morgan, B.A., B. Paed., of the Hamilton Collegiate Institute, for suggestions in this plan.

phrase and clause equivalents, also of the personal demonstrative and interrogative pronouns.

Introduction.

Short review of the pronoun, conjunction and adjective functions.

Development.

1. Teacher writes on the blackboard such a sentence as follows :—

Honest men are trusted.

What is the use of the word "honest?"

2. Men who are honest are trusted.

What now performs this function?

How does it differ from the former adjective?

Ans.—It is a clause, while the other is a single word.

3. Name the subject and predicate of this clause.

What word may be substituted for this subject?

Ans.—The word "men."

What then is the grammatical value of "who?"

Ans.—It is a pronoun standing for "men."

4. Is this pronoun personal? Why not?

Is it demonstrative? Why not?

Is it interrogative? Why not?

5. What is the value of the clause in which the pronoun "who" appears?

To what does this clause relate?

Ans.—It relates to the noun "men."

By what is it related?

Ans.—It is related to the noun "men" by the pronoun "who."

For what does this pronoun stand?

Ans.—For the noun "men" to which it relates the adjective clause.

6. In the following examples pick out similar pronouns, indicating the noun to which each refers, also the clause related to it by this noun.

The boy who was sick is now well.
The knife that was lost is now found.
The book which you gave me is at home.
This is the house that Jack built.

7. In what particulars do you find these words to agree?

Ans.—1. They are all pronouns.
2. They each refer to a noun in another clause.
3. Each relates to its noun, an adjective clause.

Technical Term.

Teacher now informs the pupils that such words are called Relative Pronouns, and that the noun to which it refers is called its *antecedent.*

Definition.

The pupils are now required to combine these facts into a connected definition.

Exercises.

1. Sentences are given and pupils are required to name Relative Pronouns and antecedents.

2. Pupils will change adjectives or adjective phrases into clauses introduced by Relatives.

3. Pupils will name the Relatives and their antecedents found in sentences in the Reader.

Number in Nouns

Introduction.

Briefly review the Noun.

Development.

1. Let several pupils give statements about objects and write on the blackboard such as are useful.

1. The window is easily broken.
2. Books are on the desks.
3. Pencils lie on the table.
4. A ruler is useful for measuring.
5. A boy enjoys football.
6. Girls play the piano.

2. Name the nouns used in these statements.

Ans.—"Books," "desks," "pencils," "table," "ruler," etc.

3. How many objects are referred to by the word "window?"

Ans.—One object.

To how many objects does the word "books" refer?

Ans.—To more than one.

Name all those nouns in above sentences used to indicate one object.

Name all those nouns meaning more than one thing.

The teacher writes these in two columns as follows:

One thing.	*More than one thing.*
window,	pencils,
table, etc.	girls, etc.

4. Suppose we wish to speak of more than one window, what word should we use?

Ans.—"Windows."

Deal similarly with the other nouns in the columns, having pupils use the nouns in each case in a sentence. The opposite columns are now filled out, each noun representing one thing having in opposite column its other form representing more than one.

5. Compare the forms of the nouns in first column with those in second column. The slight difference in form will be noted by the class. Why are these forms different?

Ans.—To denote one or more than one of the things for which the noun stands.

Technical Term.

The pupils are now told that this change in the form of the noun to denote one or more than one object is called *number*.

Definition.

The pupils will be required to frame a simple definition of number which will be written on the blackboard and class drilled on it.

Singular and Plural

Introduction.

Review the lesson on Number.

Call upon class to give names of objects indicating one thing, and names indicating more than one thing.

In each case be careful to have the pupil use the name in a sentence.

Development.

1. Teacher writes these names in columns as they are given, the pupils dictating the column in which they are to be put.

Singular. *Nouns denoting one thing.*	*Plural.* *Nouns denoting more than one thing.*
book,	books,
boy,	boys,
girl,	girls,
man,	men,
squirrel,	squirrels,
mouse,	mice,
desk,	desks,
pencil,	pencils.

2. In what respect are the words in first column alike?

Ans.—They are names denoting one thing.

In what respect are the words in second column alike?

Technical Terms.

3. The teacher now informs the class that the form of a noun used to denote one thing is called the *singular* number, and that the form used to denote more than one thing is called the *plural* number.

Definitions.

The pupils will be required to frame simple definitions of singular number and plural number. These will be written on the blackboard and pupils drilled on them.

Exercises.

1. Pupils will form statements in which nouns in the singular number are used.

2. Pupils will give the plurals of these nouns and use them in statements.

3. Sentences are given with blanks to be filled in with singular and plural forms.

4. Pupils will name the nouns in Reader and tell in what number each is, also give the corresponding singular or plural form.

*Gender

Introduction.

The teacher will write on the board,

"The boy ate an apple."

"The girl ate an apple."

What is the only difference you see in these sentences?

In the first the word "boy" is used, in the second the word "girl."

How many kinds of persons are represented by the words "boy" and "girl?"

"One."

If pupils should say "two" write such sentences on the blackboard as: A dog ate a piece of meat, a cat ate a piece of meat, and institute a comparison with the sentences first given.

Why then have we used two different words in speaking of two persons or things of the same kind?

*The author is indebted to Mr. E. T. Young, Vice-Principal of Central School, Hamilton, for this plan.

Because there is a difference between the objects themselves.

Have class write two sentences making statements about another pair of objects which differ just as boy and girl differ.

"The man walked a mile."

"The woman rested half an hour," etc.

At this point it will be necessary for the teacher to explain that this difference between the objects is a difference of sex.

Of what sex is a boy?

If answer is not forthcoming teacher must tell.

Question similarly for the term "female sex."

Development.

Write on the board the following sentences:

1. The man ran faster than the woman.
2. The sister lost her brother.
3. The girl gave the boy an apple.

Class selects from these sentences the pairs of nouns which denote the male and the female of each kind of object referred to.

man,	woman,
boy,	girl,
brother,	sister.

At this point the teacher should drill thoroughly on sex, male, female, using for that purpose the sentences just written on the board.

In the sentences on the board, how did we distinguish between the male and the female?

By the use of different nouns, one for the male and another for the female.

Why was it necessary to use the different nouns in the first sentence?

To show that we had in mind a difference of sex.

Technical Term and Definition.

The teacher will here state that this change in nouns is called *gender*, and immediately ask for a written definition of gender from each member of the class.

Definition—Gender is a change in nouns to denote whether they are the names of objects of the male or of the female sex.

Teacher will state that the noun denoting an object of the male sex is said to be of the *masculine* gender and that denoting an object of the female sex of the *feminine* gender.

Exercises.

1. The teacher will add such sentences as the following to those already written on the blackboard:—

The lion killed the goat.
The Count killed the lioness.
The man-servant chased the she-goat.
The Countess rewarded the maid-servant.

Class will write in a column the nouns of the masculine gender; also those of the feminine gender in a column beside it, each feminine opposite its corresponding masculine.

2. Masculine and feminine nouns are given and pupils are asked to give the corresponding gender noun.

3. Gender nouns to be selected from the Reader and classified as masculine and feminine.

NOTE.—If the teacher desires to retain the term neuter gender, the first step in his plan should be to classify objects into sex objects and sexless objects and apply the term neuter gender to nouns denoting sexless objects.

Case

NOTE.—Case may be defined either as form or relation. The latter is chosen for this plan. When the former conception is preferred, it will be found more convenient to teach it from the pronoun in which three case forms occur. Application may then be made to the noun.

Introduction.

Review the function of noun and of pronoun.

Development.

1. Teacher writes such sentences on the blackboard as the following:

1. John loves his mother.
2. John's mother loves him.
3. The mother loves John.
4. The mother's boy loves her.
5. He loves her.
6. She loves him.

2. Name the action asserted in each sentence.

What is the action asserted in first sentence?

Ans.—Loves.

What is the relation of John to the action of loving?

Ans.—John represents the doer or subject of the action.

In what relation is "mother" of the second sentence to the action of loving?

Ans.—"Mother" represents the subject or doer of the action.

Name those words in above sentences that represent the doer of the action.

Ans.—"John," "Mother," "boy," "he," "she."

To what classes of words do these belong?

Ans.—"John," "mother" and "boy" are nouns; "he" and "she" are pronouns.

3. The pupils are now told that nouns and pronouns used to represent the subject of an action are said to be in the *subjective* relation.

4. In what relation does "mother" of first sentence stand to the action of loving?

Ans.—"Mother" represents the one receiving the action.

It represents the one against whom the action is directed.

Name each word in above sentences, representing that against which the action is directed.

Ans.—"Him," "John," "her," "her," "him."

5. Teacher explains that the thing or person against which the action is directed is called the object of the action, and that the noun or pronoun representing this person or thing is called the object of the action word or verb.

In what relation is the noun or pronoun where it stands as the subject of the verb?

Ans.—It stands in the subjective relation. Then what would be an appropriate name by which to designate the relation of a noun or pronoun used as the object of the verb?

Ans.—The *objective* relation.

6. In the sentence John's dog can swim. With what word is "John's" connected in sense?

Ans.—With the word "dog."

In what relation does John stand to dog?

Ans.—John is the owner of the dog.

7. Teacher now explains that this relation is one of possession and that the noun "John's" is said to be in the *possessive* relation to the noun "dog."

8. Name all the words in above sentences used in the possessive relation.

Ans.—"John's," "mother's," "his."

9. The following summary on the blackboard will aid the pupils:—

Subjective relation.	*Objective relation.*	*Possessive relation.*
John,	John,	John's,
mother,	mother,	mother's,
boy,		his.
he,	him,	
she,	her,	

10. Examples will follow and pupils will be asked to state the relations of the nouns and pronouns as above to the other words with which they are connected in sense.

Technical Term.

The teacher now explains that this relation of nouns and pronouns is called *case.*

Definition.

The pupils will now frame a definition of case and this will be written on the blackboard.

Tense

Introduction.

Through conversation with the class bring out the three divisions of time and the fact that action must be either in the present, the past or the future.

Development.

1. Ask a pupil to come forward and perform some action as the taking of a book. As the pupil performs the action have him state what he is doing.

I take the book.

This is written on the blackboard.

2. What action is asserted here?

Ans.—The action of taking.

At what time is this action performed?

Ans.—It is being performed at the present time.

Use other illustrations of similar nature, drawing from the class in each case that the verb expresses action at present time.

3. Now suppose that you wish to state that John performed this action yesterday or an hour ago what would you say?

Ans.—John took the book.

John will now tell us what he did.

I took the book.

What is the action here expressed?

When is this action represented as taking place?

Ans.—It is represented as taking place in past time.

4. Now compare the statements. What form of verb did John use in first statement? In second

statement? Are these alike? Then why did he change the form of the verb?

Ans.—To denote a change in the time of the action.

Other examples of verbs in past time forms are given and the class familiarized with the necessity for a change in form to denote a change in the time of the action.

5. Now, suppose you wish to state that the action of taking will take place to-morrow or next week, how will you express it, John?

Ans.—I shall take the book.

What verb form have you used here?

Ans.—"Shall take."

Is this form the same as you have used in either of the two cases above?

Why have you used a form different from either of those above?

Ans.—That the action may be represented as being performed at a future time.

Other examples are given as above.

6. These statements are now written side by side as,—I take the book. I took the book. I shall take the book. How many different forms of the verb have been used in these sentences? Why has the form of the verb been changed?

Ans.—To denote a change in the time of the action.

Technical Term.

The class is now told that this change in the form of the verb to denote a difference in the time of an action is called *tense*.

Definition and practical exercises will follow.

Comparison of Adjectives

Introduction.

Review adjectives of quality.

Development.

1. Have pupils compare sticks of different lengths, objects of different weights, pupils of different heights, etc. etc.

What can you say of this stick as to length?

Ans.—It is a short stick.

What can you say of this other one as to its length?

Ans.—It is a short stick.

What quality represented by the adjective "short" belongs to both of the sticks?

Ans.—The quality of shortness.

How do these sticks compare as to shortness?

Ans.—This stick is shorter than that one.

Which of these sticks possess in a greater degree the quality of shortness?

2. The teacher displays a stick still shorter and holds it beside the others already examined.

Now what can be said of this stick as to its length, in comparison with the others?

Ans.—This stick is the shortest of the three.

3. Similarly secure from the pupils such sentences as,—

It is a long stick.
This is a longer stick.
That is the longest stick.
This is a heavy weight.
That is heavier.

A tall boy.
A taller boy.
The tallest boy.

Name the adjectives used in all the sentences above that are used to express the quality of the object.

The teacher will write these as given, in three columns as follows :—

short	shorter	shortest
long	longer	longest
heavy	heavier	heaviest.

5. In what respect are all these words alike ?

Ans.—Each is used to represent some quality of the object represented by the noun.

Why do we use the adjectives "shorter" "longer" "heavier" and "taller," instead of the adjectives "short," "long," "heavy" and "tall," in the sentences above ?

Because we wish to represent the object in each case as possessing the quality in a greater degree.

6. Similar questions will be put respecting the forms "shortest," "longest," "heaviest" and "tallest."

7. How then have we represented the difference in the degree of the quality possessed by the objects ?

Ans.—By a change in the form of the adjective.

Technical Term.

Teacher explains that the change in the form of an adjective to denote a difference in the degree of the quality is called *comparison*, and that each form is called a degree in the *comparison*. The names of these steps or degrees are given and written over their respective columns.

Definition and exercises will follow as in other plans.

Note.—This lesson should be followed by one on the uses of the degree forms, and the methods of indicating the Comparative and Superlative degrees.

Mood

Introduction.

Briefly review definitions of statement and verb, also inflections of the verb for tense, person and number.

Development.

1. The teacher writes on the blackboard.

    1. John studies his lessons.
    2. John, study your lessons.
    3. If John study diligently he will recover some lost time.

2. Name the verb in each of these sentences.

What is the action expressed in each case?

Who is represented as the doer of the action in each sentence?

What would you call this group of words spoken to John?

Ans.—It is a command.

How then is the assertion to be viewed in the 2nd sentence?

Ans.—It is to be viewed as a command.

3. By comparison of sentence one and three, lead the class to see that in sentence one the assertion is viewed as the declaration of a fact, while in sentence three it is viewed as doubtful or conditional.

4. Other examples are given and pupils asked to state the manner of viewing the assertion.

5. How is this difference in the manner of viewing the assertion indicated?

Ans.—By a variation in the form of a verb.

Technical Term.

The teacher informs the class that this variation in the verb to show a difference in the manner of viewing the assertion is called *mood.*

Definition and exercises as in other plans.

Note.—This lesson will be followed by one on each of the moods.

Infinitive

Introduction.

Write on the blackboard the sentences :—

1. John runs home.
2. The girls walk to school.
3. If he runs he will be warm.

The pupils are called on to read the sentences, to name the actions and finally to note the various limitations of number, time, etc., placed upon these actions.

The class is then in position to see that these are limited forms. From this the word finite may be easily developed by referring to the word "finis," at the end of a book. "Finis" means end or limit.

Development.

1. Place on blackboard the sentences :—
   (a). To run makes John warm.
   (b). Girls like to walk.
   (c). Walking is good exercise.
2. What are the verbs in these sentences? "Makes," "like," "is."

3. Name other action words in these sentences. "To run;" "to walk;" "walking."

4. Lead pupils to see that these latter words have no limitations placed upon them.

Generalization.

There are certain forms (verb) which express the action in a general way, with no limitation as to number, person, time or mood.

Technical Term.

Each of these forms is called an Infinitive, (opposed to finite).

Definition.

Derive from class a simple definition of an infinitive. (An infinitive is a verb form not limited as to number, person, etc.).

Practical Exercises.

1. Place sentences on blackboard containing finite and infinitive forms and have pupils name and distinguish them.

2. Have pupils originate examples in statement forms.

The Participle

Introduction.

Review briefly the characteristic functions of (a) Adjective, (b) Verb. This may be done through such examples as:—

(1) The *high* fence fell.

(2) The man was *innocent.*

(3) All animals *defend* their young.

(4) They *mounted* him on a white horse.

Note.—It is advisable, at first, to use in (b) Transitive Verbs.

Development.

(1) We saw the man leading the child.
(2) He kept us waiting for a long time.
(3) Tired by his long walk, he lay down.
(4) The man guarding the tower was killed.

1. Read the first sentence. What is its subject? Its predicate? What is the relation of "leading?"

Ans.—It is related to "man."

What is its use in relation to "man?"

Ans.—"Leading" describes "man."

What part of speech is "man?"

Then "leading" performs the function of what part of speech?

Ans.—That of an adjective.

2. What does "leading" express?

Ans.—Action.

Against whom is this action directed?

Ans.—Against the child.

Now write on blackboard the following sentence:

The man is leading the child.

In this sentence what is the verb?

What is the relation of the word "child?"

Ans.—The word "child" is the object of the verb "is leading."

Is there any difference in the relation of "child" in this sentence and "child" in (1) above?

Ans.—There is not.

Then what is the relation of "child" in (1) above?

Ans.—"Child" is the object of "leading."

In this sentence the word "leading" is then used like what part of speech?

Ans.—It is used like a verb.

In what respect?

Ans.—In that it takes an object.

3. Now what have we learned about the uses of the word "leading?"

Ans.—It is used like an adjective to modify the noun "man," and it is used like a verb in that it takes the noun "child" as an object.

4. In a similar manner deal with "waiting," "tired" and "guarding" in the other sentences.

Generalization.

In what respects are the words "leading," "waiting," "tired" and "guarding" in above sentences alike?

Ans.:—

1. They are used as adjectives to modify nouns or their equivalents.
2. They are used like verbs in that they take objects or are governed by adverbial modifiers.

These facts should be written on the blackboard.

Technical Term.

Pupils are now told that words which, in the sentence, perform the function of adjectives while at the same time they partake of the nature of the verb are called Participles, (participating in the nature of the adjective and of the verb).

Definition and practical exercises as in other plans.

CHAPTER V.

READING.

First comes good reading. . . . The value of good reading aloud has never been recognized. Good reading is the first training of the beginner, the last crowning excellence and consummate perfection of the finished master of all perfected culture. All skill of heart, of head, of lips, is summed up in the charmed sound of noble utterance.—*Thring.*

At the outset it is important to distinguish between reading as a mode of attention,—silent reading,—and reading as a mode of expression usually spoken of as reading aloud.

The former is similar to listening to speech, the latter involves this and adds to it, telling what is heard.

So far as the first, that is silent reading, goes, there is no difference between it and reading aloud. The first is simply thought-getting, the second is thought-getting plus thought-giving. Reading deals directly with thought; there is no such thing as reading words. Hence it would be well that a certain common exercise called reading, which is mere word-pronouncing, should be given a different name. It may be granted that the utterance of words arranged in sentences sometimes conveys to the pronouncer a hazy idea of the thoughts by the sub-conscious hearing of his own monotones and even that some people when reading to themselves seem to find it necessary to whisper or

vocalize the words; these facts illustrate the tenacity of habit and the consequent importance of starting in the right way.

The habit of saying words arranged in sentences dissociated from thought, whether reading so called, or repeating definitions, is one of the most pernicious that a pupil can form. Let no exercise be called reading, not even in the first lesson of the Primer that does not depend on attention to the thought symbolized by the words of the sentence. It is of much importance that, from the first, both teacher and taught should clearly distinguish between *Reading* and *Pronouncing Words*.

Those who have perseveringly tried to teach reading by imitation and rule admit that the results are transitory and disappointing. Listen to children engrossed with their games. Their pronunciation and composition may be very defective, but their inflections and emphases are well-nigh perfect. Nature thus teaches that the direct path to correct expression is by attention to the thought. Col. Parker maintains that teaching reading consists entirely in the presentation on the part of the teacher of the conditions for the functioning of words. There is no doubt that attention to thought must be the basis of any rational method of teaching reading.

Several methods of teaching reading to beginners have been devised and practised but we have not yet reached a concensus as to which is the best. The reason is that the personality of the teacher counts for so much. Sympathy, interest, intelligence, diligence, earnestness, as well as confidence in the method used, each and all, count as factors in producing the

result. The sympathetic, diligent teacher of young children using an inferior method will always surpass the spiritless teacher using the superior one.

Clearly, children might learn to read as they learned to hear and speak, not by practising the analysis of words and the synthesis of their sounds but by efforts upon words as wholes and combinations of words. They learn a few words, slowly at first, by oft-repeated efforts, then short sentences, and later, words and sentences rapidly by unconscious inductions and generalizations. Such efforts, at first, and mainly throughout, are due to the impulse of thought and the desire to communicate thought. This is essentially true notwithstanding that so much of the chattering of young children is to gratify the pleasure of exercising their newly found faculty of speech.

Words, spoken or written, are symbols capable of arousing the appropriate mental activities whether the stimulus acts through the ear or through the eye. It is an open question whether the learning of a word requires a greater number of aural or visual stimuli. In addition to the difficulties arising from the irregularities of English spelling, there are obvious physical reasons why learning to read and to express thought by writing takes more time and labor than to know spoken words and to speak. Were it not for these difficulties a deaf-mute child of five or six years of age might acquire the knowledge and use of as large a vocabulary as that possessed by a normal child of the same age.

In a period of two or three years most children learn to speak their thoughts by the hear-and-say

method, and in a like or somewhat briefer time they might, on attaining school-age learn to read by the look-and-say method.

It is not proposed here to describe in detail all the different methods of teaching reading to beginners. It is enough to say that in the Word method the beginner starts with the word as a whole; in the Sentence method with the sentence; in the Alphabetic method he learns the names of the letters; then he begins to spell by letter-names and pronounce words, *e.g.*, "double-you-ā-jee, wag;" in the phonetic method he learns a phone for a different character for each different sound in the language, and spells the phones to suggest the word (in W. L. Robinson's phonetic alphabet there are sixty-five and in Sir Isaac Pitman's thirty-six characters); in the phonic method he learns the sounds of the unaltered letters of the English alphabet and their combinations and synthesizes the sounds to make the word.

The special advantage of the Word method is that the start is easy and can be made interesting; its disadvantage is that the learner takes a long time to reach the inductions which enable him to recognize new words. The advantage of the Sentence method is that the reading is intelligent; its disadvantage is that of the Word method in an increased degree. The advantage of the Alphabetic method is that it lays the lightest tax of any method on the energy and ingenuity of the teacher and is therefore suited to the lazy or unresourceful; it has the disadvantage of the former methods and is almost invariably—although not necessarily—followed by monotonous, thoughtless reading. The advantage of

the Phonic and Phonetic methods is that they make the recognition of new words easy and rapid; their limitations arise from the incompleteness and redundancy of the alphabet and the irregularities of English orthography.

By each and all of these methods the learner acquires the ability to recognize new words by similar analytic-synthetic processes. By the Word and Sentence methods, and to some extent by the Alphabetic method the child attempting to pronounce new words combines elements which he has learned as the result of many unconscious analyses. The child taught for example by the Alphabetic method says "double–you–ā–ess, *was*," "double–you–ā–jee, *wag*," etc., etc., and learns by-and-by the adjustment of his vocal organs necessary to utter the first sound in the new word *wigwam* by its association with the utterance "double-you," and later, by its association with the visual stimulus. The greater the similarity between the name of a letter and its sound the fewer repetitions are required to establish association between them.

A fair measure of the efficiency of a method of teaching primary reading, *i.e.*, the mechanical-mental stage, is the time and effort required to take a beginner from the start until he can readily discover a thought within the range of his knowledge or experience written or printed in words that are nearly or quite regular in their spelling, some of the forms of which are new to him. For the test let a sentence in large print be selected from a book or let one be improvised and written on the blackboard. Take for example:—"Nate Gar–land is coming from

Fre-mont to vis-it his cous-in Carl Brisc. Carl says that Nate will teach us how the boys in Fre-mont play pris-on-er's base." An average pupil, six years of age, receiving three ten-minute lessons a day *with appropriate seat work*, can be taught in from sixty to ninety school-days to read so that he will be able after silently studying an exercise like the above for from two to five minutes, to turn his back to the blackboard and tell what the sentences say, provided that the names are familiar or that his memory can retain them. This week (in October) to a class of little children in a rural school, who took their first lessons in April (preceding) and hence had been at school less than ninety days, the following test in word-recognition was given. Four names—*Bertha Carter, Parkhill, London, No-vem-ber*, were written in a column on the blackboard and the class directed to make up a story using these words. In less than two minutes one little fellow stepped up to the examiner and in tones so low as not to be heard by his class-mates said—"Bertha Carter lives in Parkhill; she is going to London to visit somebody in November." The only word of the four that they had previously seen, so the teacher averred, was *London*.

Two hundred times a year for over twenty years the writer has had the opportunity of observing the methods of teaching reading practised by many different teachers, and of testing the results of these methods. He proposes here to discuss and describe the method which has produced the best results he has seen. If it has to have a name it may be called the Inductive-Phonic method. While agreeing with

Dr. Stanley Hall that there is "no one and only orthodox way of teaching reading, the greatest and hardest of all the arts in which ear, mouth, eye and hand must each in turn train the others to automatic perfection," yet he contends that every successful teacher of the subject must have some way whose steps are related and whose processes are suited to the child-mind.

The aim of the instructor of beginners in reading should be the natural, oral expression of thought apprehended by the child from his (the child's) own silent reading of the sentence. The process from the first and throughout should enlist the learner's interest and can easily be made to do so.

Children at the proper stage become as much interested in the discovery of words, or of pronounceable combinations of letters that are not words, by the synthesis of their phonic elements, as they can be in any other exercise connected with reading by any method. The interest of the very beginners can be most easily enlisted in real words, such as *cat, dog, candy, doll, etc.* This is one reason for starting by the Word method. Another reason for so starting is that by a judiciously selected list of words the teacher can present the alphabet to the young learners in such a way that without telling them the sound of a single letter they can by their own induction, directed by the teacher, discover the sound of each and every one of them by the process to be illustrated presently, and hence almost from the first assist in furthering their own progress.

How shall the first word be taught? This question raises another—what shall the first word

be? Those who have started with *cat, rat* and *hat,* each under a picture, can corroborate the criticism that these words too closely resemble each other to be suitable for a first lesson by the Word method. A graver evil is the presence and position of the pictures. They are not needed to give the child a concept of the things for which the words stand and their presence begets a tendency to look outside of the word rather than at the form of the word itself for suggestion as to what the word is. Such pictures would obviously be helpful to deaf-mutes and to foreigners who are learning at once the form and signification of words. They are of service to other children if used, as will be shown later in connection with the "Key-list."

Almost any familiar word will do to start with.* *Candy* is as suitable as any other. Write it on the blackboard, preferably in vertical script, with letters separated. Tell the child that the word is *candy.* Do not waste time asking the child such questions as "What would you like to find in your stocking at Christmas," in the hope that in the list he may mention *candy.* More than half the time of many a reading lesson has been lost in a worse than useless circumlocutory "development" of words. Write the word again, write it smaller, write it larger, write it larger still, write it very large, write it very small. The learner will observe you closely and will say *candy* every time it is written. Write several other words,—the learner will tell you which

*Experience proves the unwisdom of confining the opening lessons to words of not more than three letters. The more striking the contrast in the form of words the more easily beginners learn them by the Word method.

are *candy* and which are not *candy*. Have the child take the crayon and guide his hand in writing the word. This is not to teach writing, but to train him in *observing* and *comparing* word forms. If the word has been written with the letters separate have him take the pointer and show you what letter to write first, then next, and so on. To take to his seat give him an envelope or a little box with a score or more slips or tablets each bearing a word—underlined that he may know the bottom from the top—several of which have the word *candy* written on them. Direct him to pick out all the slips that "say" *candy* and place them in a row, then to find any others that seem to be alike and to lay such in rows by themselves.

At his second lesson review *candy* and similarly teach another word, *waggon*, for example. Have him point out a letter in *waggon* that he does not see in *candy*, and a letter that seems the same in both words; neither name nor sound of the letter is mentioned, attention is called to form only. Give him seat-work as before.

At the third lesson review the two words taught and teach another, for example, *cat*. With *cat* and *candy* in favorable position for comparison give him practice in pointing out similarities and differences in *form*. Continue seat-work on the lines proposed above. Don't distract attention by telling stories about cats, waggons, etc. A serious and common fault is diverting children's attention from the real point of the lesson not only by roundabout "development" of words already referred to, but also by anecdotes that happen to have a sort of verbal

relevancy to the lesson. These stories, etc., intended to direct attention to the lesson, but generally diverting it, have value in connection with the language lessons, but are out of place and worse than a waste of time when one is teaching word recognition.

The power gained in learning to recognize quickly several easily contrasted words, such as the examples given, qualifies the learner for the acquisition of a number of words which we shall call a key-list. These, each teacher will, according to circumstances, select to suit the class of learners. One is given here for illustration: *Cat, dog, hen, pig, mug, rat, lid, box, sun, fan, web, jug, lath, ship, king, chick, vest.* These contain all the letters used in Part I. Other things being equal, such as the suitability of the words, the shorter the list, the better. Some teachers say they find initial consonants easier for beginners to separate from the words than final ones; others say they have better success with final consonants. Teachers who use one class pretty exclusively would require a longer list of key-words than those who use initial and final consonants indifferently.

As each word is taught it is given an abiding place on the key-list chart,—a strip of heavy paper may be used of about eight by thirty-two inches, or sixteen inches square—and an outline picture added after each. Instead of drawing them, pictures cut out of old papers may be gummed on the chart. For large classes the key-words should be written on a larger chart or on a blackboard.

cat.

dog.

hen.

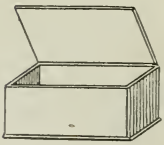
pig.

mug.

rat.

lid.

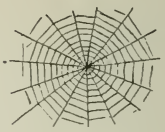
box.



sun.

fan.

web.



jug.

lath.

ship.

king.

chick.

vest.

For reasons already stated the picture is added to each word *after* it is taught. The pictures are put there for the benefit of those pupils who may have been absent on the days when some of the words were taught and to make the words instantly available as a phonic key for reference by all the pupils of the class. It is not necessary that the whole list should be learned by the Word method before it is used for its specific purposes, as described hereafter.

Concurrent with the foregoing exercises in learning words by the Word method the pupils receive training in *oral* phonics. Devote a minute or two at every lesson to such training. Begin by requiring the synthesis of the sounds of easy words such as *cow, shoe, chalk, sheep, knife, mouth, nose, sky, slate, cheese.* The teacher may ask the child to tell what is in his closed hand. The child doesn't know. "I will tell you," says the teacher, "it is a n—ī—f." If the child cannot synthesize the three separate sounds, try him with two nī—f or n—īf. Not much ingenuity on the teacher's part is needed to teach a child to combine any two or three assimilable sounds. The blackboard is not used in these exercises.

Long-vowel words are the easiest to begin with. When the sounds of words like the examples given above can be synthesized proceed to short-vowel ones such as *cat, dog, hen, pin,* etc.

As a second step in oral phonics the teacher vocalizes the sounds, the child imitates and then combines them. The teacher should aim at purity of phonic enunciation on the part of the pupil. Some teachers are unsuccessful solely on account of the incorrectness of their phonic analysis. When

analyzing *pen* for example, they say *peh–eh–nuh.* They might as well spell the word by the old alphabetic method. The most common impurity — not by any means the only one—in phonic analysis is the kind of aspiration referred to above. Taking a few lessons in Pitman's phonography will prove of much assistance to the teacher of phonics.

In the third stage the pupil will analyze the words used in the first set of exercises in response to the teacher's dictation. He should proceed to the separation of, at least, the initial and final consonants. It is not desirable to detain him in oral work until he can separate the short vowel sounds in, for example, such difficult words as *pin, hen.*

The foregoing work in words and oral phonics, which may be accomplished in a week or ten days, prepares the learner to begin "written phonics." To illustrate how this can be done successfully take the word *dog* which the child knows when he sees it written in separated letters on the blackboard. When he hears the word *dog* he can tell the first sound, or the last one. With pointer in hand he can show the first letter and as he knows the first sound he can at once correctly answer the usual question—"What does that letter 'say?'" He can also find the sound of *g* and in like manner discover by his own easily made inductions the sounds of all the other consonants in the key-list. Using this list give such practice as, "What does this letter say; what, that?" and so on. Then direct the learner to point to the letter that says *tĕ*; to the one that says *sĕ*; to the one that says *ĕ*, etc. Throughout Part I. and even in the first reading of Part II. there is nothing gained,

but on the contrary often serious hindrance, in speaking of the individual letters by their ordinary names or any other designation than their normal sounds as used in the key-list.

The teaching of the short vowels presents some difficulty and various devices have been adopted to overcome it. Sometimes they are taught like the consonants from analysis, but the difficulty lies in obtaining pure vocalization. One method of surmounting it is by treating the short vowel and its sequent consonant as a digraph. Exercises for practice may be written on the blackboard thus:

c–at	d–og	h–en	p–ig	m–ug
an	on	et	in	un
am	om	em	im	um
ap	od	ed	id	ud
etc.	etc.	etc.	etc.	etc.

The drilling is conducted in vertical and then in horizontal lines and finally promiscuously. If you point (*) to *im* for example and the child hesitates then point to *m*, if he hesitates still direct him to show you that letter in the key-list, which should be hanging convenient for reference. He tells you at once what it says there. Impress the sound on his memory. Go back to *im*; if he does not know it now point out *pig*, then *ig*, then *im*. Thus he learns how he can find out for himself what these combinations of letters sound and he can, while at his seat, practise columns containing review and new combinations and be prepared to pronounce them

(*) In all these written word and letter exercises it is an excellent practice to use two pointers to delimit precisely the letter or combination of letters you wish the child to sound.

readily when he comes to his class. Some very successful teachers in phonic-spelling exercises require the child, when he is not ready at once to pronounce the digraph, to prolong the short vowel sound until he recalls what the sequent consonant says so as to make the vowel sound coalesce with that.

Different children vary greatly in the rapidity with which they can learn to discover the sound of a letter from its use in a known word. A certain little girl was not at all a prodigy who, taught in the manner here described, told her mother on the evening of her first day's practice in phonic discovery that she had learned all the letters in that day. There is usually something wrong with the teaching if it is found necessary to *tell* the learner the sound of a letter. Some of the advantages of teaching the letters by this inductive-phonic method are that children learn them quickly, their interest is easily maintained by the excitement of discovery, their minds receive a useful kind of training, and they are at once put in position to help themselves and so to do more than mere review work at seats. Indeed, the difference in the progress of classes taught by different users of this method seems to be measured by their skill and diligence in assigning appropriate seat work.

The child began oral phonics by synthesizing the sounds pronounced by the teacher. One or two intermediate steps followed bridging that exercise with its converse which qualified him to associate appropriate sounds with their corresponding signs in words that had been learned by the Word method.

He is now ready to synthesize the phonic elements of written words. Knowing *c–at* he can discover by referring, if necessary, to his key-list *b–at*, *m–at*, *l–at*, *d–at*, *f–at*, etc.; knowing *d–og* he can discover *l–og*, *t–og*, *f–og*, etc.

The teacher will now prepare or determine upon a graded series of phonic exercises. He may use and enlarge the lists in the text-book taking those in Lessons 7, 8, 9, 13, 14, etc., to the end of the Ontario Primer, or he may follow the order in which the consonants are taken in his key-list, or he may devise a series which he thinks better than either. He must determine how far he will carry these phonic exercises before he begins sentence reading.

He may begin work on the sentence when his pupils can easily recognize three-letter combinations or he may delay it until they can readily synthesize four or five-letter combinations. I have seen a class that had not done any reading, working with evident pleasure on a column of combinations including *cam*, *gran*, *brust*, *clash*, *shark*. *A*, *e*, *i*, *o* and *u* were called "the starters." The column may or may not have been studied at seats. The pupils as called stepped to the board and with a pointer in each hand started with the digraph formed of the vowel and its sequent, pointed out and pronounced *us*, *ust*, *rust*, *brust*; *ash*, *lash*, *clash*, etc. The teacher similarly pointed and marked off the more difficult combinations, the pupils answering as called upon and for review, simultaneously.

Successful teachers vary with respect to the extent to which they carry these phonic exercises before reading is begun but if a good foundation of

ready word-recognition be laid the progress in reading is very rapid. Some of them go so far that the pupils can readily pronounce any regular word in Part I. or indeed almost any combination of four or five phonetically compatible letters. Up to that stage the exercise nearest reading which they had practised was, by way of language lessons, composing sentences containing specified words.

But whether reading be begun at so advanced or at an earlier stage, this principle should be most scrupulously observed that the child must recognize every word in the sentence and then, after silently construing the words, read the sentence, that is, tell in natural tone and expression the thought that the sentence has told him. One day a child after studying the sentence—"The big pig is in the gar-den"—raised his hand to imply that he could read it. He said quite earnestly, "The pig is rootin' up things in the garden." His experience probably filled out the mental picture suggested by the words. That was reading. Had he said "the–big–pig–is–in–the–gar-den" in measured monotones he would have been pronouncing words, but not reading in any sense.

In anticipation of the first reading lesson some teachers teach, by the Word method, a few phrases such as *a cat, the cat, my cat, a dog, the dog, I see*, etc., as though these were words of two syllables. The common habit of saying *thuh cat* is as disagreeable and incorrect as *thē cat.*

Assuming that the first reading lesson is to be given on the sentence,—*A cat is in the man's hat*,—the teacher says to the child, "Do you know every word in this sentence?" The child does. "Is it

about a dog?" The child—"No; it is about a cat." "Where was the cat lying?" Answer—"In a hat." "In whose hat?" Answer—"In the man's hat." Or the teacher may tell the child to take the two pointers and show the words that tell where the cat was lying, while one of the other pupils in the class may be required to read the words so pointed out; or the curtain* is slipped over the sentence and the teacher gets the pupils to tell what the sentence says.

The next sentence may be—"The man has a cat on his arm." "Do you know every word in this story?" asks the teacher. The sounds in *arm* may have to be synthesized aloud. "Now can you tell me what the story says?" The child may need assistance. If so, he is to be aided by questioning as before; if not, the curtain may be slipped over the sentence or the child may look at the teacher. He may say, "The man is carrying a cat on his arm." The word *carrying* is not in the sentence, but no matter. We are at *Reading* now, and reading first and foremost is attention to the thought. Enough that the child has combined the words, found the thought and expressed it naturally. Let it be distinctly understood and invariably acted upon, that whenever words arranged in a sentence are submitted to a learner it is for the purpose of training him first in thought-getting and second in thought-expressing. He is never, *never*, to be permitted to proceed, saying, "The–man–has–a–cat–on–his–arm." In these sentences the voice is not to articulate the words until the mind

* Many teachers have a wire stretched along the top of the blackboard on which they suspend by rings a yard or two of thin curtain. This curtain is used in various blackboard exercises.

through the eye has gathered them into groups that to the child have some sense.

It is not for information that the child is reading now; he is carried on by the pleasure derived from the exercise of his increasing power to discover the thoughts symbolized in the sentences. Those who urge enlistment of interest by using desire to express intrinsic thought could not deny that the mere discovery of thought in a commonplace sentence such as "*Ned hit the dog on the back with a big stick,*" is sufficiently interesting if they witnessed the animated eye and expostulating hand emphasizing the exclamation —"Please sir, I know what it says; I know it, let me tell!"

Although many common words are not spelled strictly phonetically, yet these do not offer formidable difficulty to the child taught by the method outlined here. In the blackboard lessons a few diacritical devices may be introduced such as drawing a light line through silent letters and slurring combinations of letters representing single sounds, *e.g.*, breath. In exercises for phonic synthesis it is advisable to adhere to normal combinations, but when irregular words occur in sentences some of the elements of the word and the context usually enable the child to surmise them. In a story of a dog and a cat it was related that "*Fred put them both in a wag-gon.*" A child, trying to read it, said, "I know all the words but I cannot read it." She was pronouncing *both* with the short sound of *o*. On being asked to tell what it seemed to say she made the attempt and then, smiling, said, "O, I know now what it says," and interpreted it correctly. When words so irregular as

knife, *rough* and *their* occur it is best to anticipate the difficulty and tell the child at once what to call them.

Under present circumstances by the method of teaching reading outlined here, the blackboard or charts made by the teacher will be used almost exclusively for the foundation work. In the first place training in word recognition proceeds so far before reading is attempted that when words arranged in sentences are submitted, the efforts of the young learner are taxed to recognize not the words but the thought that the words tell. Thus, reading from the first is natural and intelligent. Secondly, separation is effected between the learning of a sound and the learning of a sign for the sound; each acquisition is applied and perfected in turn. Sure and rapid progress in word recognition by the phonic method is founded on the child's power to synthesize the sounds symbolized by the letters. In the third place, letter naming is avoided. Not infrequently a visitor might hear such a colloquy as this: Teacher—"What letter is that?" Child—"*Jee*." Teacher—"What does *Jee* say?" The child then gives the sound of *g* as heard in *get*. The beginner's progress will be retarded if with each letter are established two associations—name and sound—particularly when the name is the better organized of the two.

Even though the blackboard be the only "reading book" for the first two months it is necessary that the reading lessons as well as the phonic exercises be graded. The teacher may write a series of reading lessons, short, bright, interesting stories, original, or culled from every available source, on

charts (sheets of wrapping or heavy printing-paper), but it is convenient and fairly satisfactory to choose from the primer, omitting the first six and the 11th and 12th lessons.

Transition from script to print will be made before promotion to Part II. of the First Reader. It is more easily made from vertical than from slant script. To make the transition use the authorized printed tablets and begin with practice in phonic spelling, *i.e.*, sounding the letters and pronouncing the words. A week's practice will qualify the class to read as easily in print as in script. Go through the tablets reading several of them a day, always keeping in mind that reading is thought-getting and thought-expression. Then take the book (Part I.) and beginning at the 13th lesson read it through, which, if proper seat-work on it be assigned, can be done at the rate of two or three pages a day.

The learner is now ready for promotion to Part II. He can read well enough to enjoy a story suitable to his age printed in easy and mostly regular words: perhaps he can also write it so legibly that he can read it from his slate or exercise book. He has wasted no time in letter naming or oral spelling by letters. He may have concepts of number up to eight or ten, and his exercise book may be filled with attempts at writing words and sentences and interpreting them by pictures. I have known some teachers make much use of this exercise as a seat occupation. At the close of a lesson in Part I. they would write a few review sentences, *e.g.*, "the doll is sit–ting on the bench with its back to the wall," for the class to read

silently at seats and then interpret by drawing pictures. Children at this stage show less hesitation to attempt such illustrations than older pupils who have not been accustomed to this work.

The work in Part II. need not take long to describe. Using the authorized book run rapidly through it, reading only a sentence or two in each lesson, but paying special attention to the exercises in phonics. The class well taught in Part I. can go to the 16th lesson at the rate of four or five lessons a day. The lengthening of the short vowel by the final *e* mute may be taken up in two or three lessons, and the five vowels dealt with together. Lengthening *o* and *e* by doubling them is easily taught. An easy way to teach the long vowels represented by *ai* and *ay*, *aw*, *ea*, *ew*, *ie* and *y*, *oa*, *oe*, *oi*, *ou*, *ow* and *oy*, is by a key-list written on a chart and a picture added after each in a manner similar to the list given for Part I. For this purpose the following list has been used with success:

zig-zag

pie.

yoke.

boat.

boot.

hoe.

queen.

oil-can

pail.

house

hay.

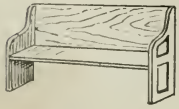
cow.

saw.

crow.

leaf.

pew.



boy.

Having reviewed the phonics of the book in this manner the learner is prepared to return to the beginning of it and read the lessons at his seat. He can make out nearly all the words and will by his own study of the lesson be prepared to answer questions on the subject matter or to show the sentence that answers the question, and then read it if required to do so. His progress will be at the rate of two or three pages a day; the poetry will be omitted until the next reading. As a seat exercise he transcribes part of his lessons, care being taken to have him form the habit of writing thoughts. Some pupils in their transcriptions do not even write words as such, but transfer groups of letters without mentally pronouncing them. Obviously such occupation aids neither reading nor spelling. Transcription should always be done with so much care as constantly to improve the writing.

The work up to the completion of the second reading of Part II. has been repeatedly accomplished in from sixty to eighty school days and it represents a degree of proficiency in reading that has been accepted as qualification for promotion to the Second Reader. But important work in reading remains to be done before promotion. Hitherto the reading has been strongly emphasized on the side of attention or thought-getting, not for the purpose of increasing knowledge but to lay the foundation of that process of defining, interpreting and construing which Dr. Hinsdale calls the basic element in all reading. At the next reading of the book attention will be strongly directed towards *expression*.

If the young learner can recognize words easily

and has formed the habit of gathering them with the eye and then vocalizing them not as so many separate words but as groups of related words, such reading will be intelligent and intelligible and yet it may be greatly deficient in respect to expression. Now is the time to lay the foundation for expressive reading. The voice is flexible, the subject matter is within the child's experience. Thought and feeling will prompt the suitable kind of emphasis and inflection but these require reinforcing and the learner must be made conscious of their value and mode of production. "Imitate me" should be the last resort of the teacher who aims to strengthen or refine the qualities of his pupil's vocal expression. One may imitate without thought or reason. The chief reliance should be placed on judicious questioning. Referring for illustration to the first lesson of Part II. the pupil reads: "Fred and Will are going to the pond." Teacher—"Who did you say are going?" Answer—"*Fred* and *Will*." Teacher—"Read it again so that everyone will know who are going." Teacher—"Going where?" Answer—"To the *pond*." Teacher—"Read it again, bringing the boys and the pond before our notice." Second sentence: "They both are fond of fishing." "What new thing is told us here?" Answer—"That the boys *like fishing*." "Read it to make the sentence tell that." Third sentence: "Fred's rod is so long that it bends as he holds it in his hand." "What does this sentence tell us?" Answer—"That Fred's rod is a long one." "How long?" Answer—"That it bends." "Read the sentence to make it say so plainly." Pupil reads: "Fred's rod is *so long* that it *bends* as he holds it in his hand."

In like manner the other sentences of the paragraph are examined and practised and finally the whole paragraph is read. Not every paragraph is treated thus thoroughly, but some part of every lesson is devoted to the rational improvement of expression.

Most of the lessons in the book are suited to train pupils to read expressively. A few, *e.g.*, Nos. 3 and 14, are of little value, hence the advisability of taking up some lessons more thoroughly than others. This remark applies with special force to the pieces in verse. Some of them, *e.g.*, "Baby-bye," "Lady Moon," "What does Birdie say," and "They Didn't Think," are well worth careful teaching. The voice should respond to the rhythm without being carried off by it. Skip the rhyming lessons that you cannot prevent the children from reading in a swinging sing-song.

In the prose lessons avoid depriving the children of the pleasure of finding out the story. The assignment of a new lesson as sometimes done consists mainly in telling the children what they should be left to discover. This deprives them of a real pleasure and robs them of the opportunity of deriving from the lesson its highest value.

The lessons in verse should be taken up with a somewhat different purpose from the prose ones, or rather with an additional purpose. The proper teaching of one of them should make such an impression on the child's mind as would prompt him to say, "Oh, mother, we had a beautiful lesson to-day; let me read it to you!" Teach the piece so that its esthetic quality will appeal in some degree to the child's sense of beauty. One way to do this, is, in

assigning it, to read it in your very best manner while the children watch you and listen to you. Read it again while they follow the lines on their books. Read it so that they will know the thought and feel the beauty. Discuss with them the beautiful thoughts and the beautiful expressions. Lead them by questioning to see the main thought in each stanza and to note the relation and arrangement of these thoughts. Explain difficult words and phrases. It may be well to read it for them again and then to have them read it not only by stanzas in turn but also facing the class read the whole poem. Finally, when they understand the poem and like it have them memorize it.

When memorizing is assigned it is not enough to say "Get so many lines off by heart for to-morrow." Instruct them how to memorize and occasionally devote a recitation period to this instruction. Commence with an easy exercise, *e.g.*, "The darling little girl," page 53. If this lesson has been taught as described above the pupils will have noted the repetition of the question and will easily learn its variations. The answers naturally follow the variations in the questions. Having fixed that the 1st stanza pictures the *seeing* of her sweet face; the 2nd the *hearing* of her pleasant voice; the 3rd the *knowing* of her pure thoughts and acts the memorizing may then be completed in five minntes. Again in the poem "What does little Birdie say?" page 43, the blackboard should be used to show the parallelism between Birdie and Baby. When that is neatly done the memorizing will scarcely require an effort. In like manner in every piece worth

memorizing the teacher can find some means of lessening the profitless drudgery that too often attends the exercise known as learning by heart but which often has very little *heart* in it.

The mind receives, retains and recalls (recollects). Repeated recollecting secures retention. It is therefore necessary to occupy part of the time devoted to memory work to recollecting—writing or reciting poems previously memorized. Memorize only the best, and review them several times. These poems in the memory may be likened to pretty paintings hung round the parlor; if they are worth putting there they are worth keeping free from dust and cob-webs.

Dictation and oral spelling will be added to transcription in this the final reading of Part II.

Recapitulation

Part I.

Easy words by word-method;
Key words by word-method;
Oral phonic synthesis by children;
Oral imitation by children;
Oral analysis by children;
Phonic analysis of key words and association of letters with their sounds;
Phonic synthesis of the sounds of written (or printed) letters aiming at proficiency in pronouncing combinations of letters;
Reading, *i.e.*, cognition of thoughts from written or printed words arranged in sentences.

Part II. of the First Reader.

(*a*). Phonics of remaining consonants, of two-and-three-consonant combinations, and of the long vowels.

(*b*). Reading the book for practice in applying the instruction under (*a*), and for continued practice in thought discovery.

Transcription.

(*c*). Reading the prose lessons for practice in expression.

Reading poetry;

Memorizing;

Dictation and oral spelling.

The Second Reader—The principles and practices applied to the teaching of the final reading of Part II. of the First Book are applicable and appropriate to the work in this grade. If a child leaves the Second Reader with a monotonous, inexpressive habit of reading, the probability is great, that he will never become a good oral reader.

The incentive to read for information begins to appear now. The learner is ceasing to feel pleasure in merely cognizing thoughts in the sentences he reads, but he is beginning to enjoy reading as a means of extending his knowledge or leading him into new fields of imagination. He revels in the fairy lands of the nursery classics.

As interest in the subject matter increases the teacher should give correspondingly increased attention to vocal expression. Gradually he should introduce exercises to train the pupil in the

conscious use of means that enhance the force and beauty of his utterance. To do this well requires skill on the part of the teacher. One day at recess a teacher and an inspector were discussing this subject when it happened that a boy said to another at some distance, "Frank, are you done with that knife yet? I want to use it myself now." The words were written on the board and the boy called to read them but the teacher was unable to get the propriety and force of the expression which the boy had used under the impulse of intrinsic thought. The boy realized that he was not reading it as he had spoken it, but he lacked the skill in the conscious control of his organs to produce the desired effects.

Good oral reading is a very complex art. It depends first on good silent reading which involves the art of interpreting symbols capable of laying before the reader's mind the author's thought, feeling and purpose; and second, on an extensive training in the use and control of the powers of vocal expression. From this stage forward the somewhat mechanical translation of symbol into spoken sound will be subordinated to the clarification of the insight into the author's meaning, later called literature, and to training in vocal interpretation or elocution.

The latter sub-division, while so largely dependent on thought, nevertheless has an important and complex mechanical side. All its elements cannot be taught together; they should not be taught at haphazard, but the teacher's plan should previse a judicious arrangement of these elements, giving special attention to one at a time, choosing lessons to multiply examples of it, and dwelling on it

until it becomes incorporated with the reading habits of the learner, who, while led onward and upward to the more and more difficult is ever carrying along with him the fruits of his previous efforts.

This is not the place to write a treatise on elocution, but it is proposed to show by a few examples how the teacher's knowledge of that subject, acquired as a part of his academic education may be applied in the teaching of oral reading to intermediate classes.

Every paragraph, sentence and even part of a sentence, being a group of related words, has a core or central idea. By a species of analysis in the silent reading or as a result of the teacher's questioning, the reader determines this central idea. The recognition of that determination in the oral reading is called emphasis. How emphasis, while it would yet be premature to use the term, can be taught by judicious questioning, has been already illustrated in the final reading of the 1st lesson in Part II. of the First Book. A class in the Second Reader is prepared to appreciate the value of emphasis, and to learn how to strengthen or otherwise modify it at will. With the purpose of showing the value of emphasis by Force, and for practising it, the teacher will prepare a few blackboard exercises. The following will serve as examples :—

1. Did you wheel to London yesterday? No; I walked.
2. Did you wheel to London yesterday? No; my sister did.
3. Did you wheel to London yesterday? No; I went to Parkhill.

4. Did you wheel to London yesterday? No; I went on Saturday.

5. Did you wheel to London yesterday? No.

This lesson may be recited in a variety of ways after it has been studied a few minutes by the class. The teacher may read, "Did you wheel to *London* yesterday?" and require the class to infer from the answers which question he read; or he may require the pupils to read the question from the answer—"No; I went on Saturday;" or the pupils may be called on by twos—one to read the question, the other, the corresponding answer; finally each pupil in turn will read all the questions and their respective answers. Deal similarly with the next exercise:—

1. Who made that noise? He broke my slate.
2. What did he do? He broke my slate.
3. What did he break? He broke my slate.
4. Whose slate did he break? He broke my slate.

In the foregoing exercises no underlining, or other clue than the meaning, should indicate the emphatic word.

As another kind of exercise, have the pupils tell the circumstances under which each of the following readings would be appropriate:—

1. *That* little girl adds quickly.
2. That *little* girl adds quickly.
3. That little *girl* adds quickly.
4. That little girl *adds* quickly.
5. That little girl adds *quickly.*
6. That little girl adds quickly.

Deal similarly with the sentence, "The sweet odor rises from that white flower." Indeed, it is

easy to multiply examples for exercise in varying the meaning according to the varied emphasis by Force, and thereby illustrating that the correct reading of a sentence may require not only the understanding of what precedes it, but also in many cases of what comes after it. After practising such selected examples, specially suitable lessons may be chosen, *e.g.*, "The Idle Boy," "Who Stole the Bird's Nest," "No Crown for Me," "Tommy and the Crow." (1).

Another kind of emphasis—that of Time—was partly illustrated on page 170. It is of more frequent employment, but to use consciously requires more careful discrimination, than emphasis by Force. Raymond, in "The Orator's Manual," lays it down as a fundamental rule, that the relative time apportioned to a word indicates the mind's measurement of it, *i.e.*, the speaker's judgment as to the amount of importance that it conveys. It is easily applicable to words with long vowel sounds and prolongable consonants, and it contributes largely to that quality of light and shade necessary to make oral reading agreeable as well as intelligible. As an example take the first paragraph of Lessson XII., Second Reader.

I wonder if *any* of us ever s a w *this* little girl. She did not mean to be a n a u g h t y girl, as she loved her father and mother, and would have been very sorry to d i s o b e y them. She wished to do well but she did not carry o u t her good wishes. When told to *do* anything, or to *go* anywhere, she would s a y——.

The general rule is that the new or distinctive

(1) Ontario Second Reader, pp. 12, 27, 47, 76, respectively.

idea is emphatic unless when a word is immediately repeated for emphasis. In the second sentence it would be wrong to emphasize the first "she;" the new ideas are introduced by the words "mean," "naughty," "sorry" and "disobey," and these are not all of equal emphatic value. The judicious teacher would not expound the rule and by direct application of it hope to get the learner to read the sentence well, but he would revert the learner's attention to the sentence, that, owing to appreciation of the thought probably in consequence of judicious questioning, had been well read, in order to make the reader conscious of his art. From such repeated examinations he can gradually deduce the rule.

Emphasis by slides of the voice, or Inflection, may be made the subject of special instruction in the advanced second class, but it has difficulties that will not be mastered below the high school. True, a child in the primer can understand what is meant by raising, maintaining or lowering the voice, and can consciously use appropriate slides in reading such sentences as, "Have you learned your lesson yet?" "What is the title of it?" He would under the impulse of his own thought say, "Will *you* come to our′ place with mé or shall I` go to your` placè with yoù?" He could distinguish the meaning if he were asked the questions: "Is your lesson about sú-gar or cotton′?" "Is your lesson about súgar or cot`-ton?" Yet these would be difficult enough exercises for the Third class to read. It would be a well-taught senior Fourth class that could deduce the generalization that negative ideas take the rising inflection and positive ideas the falling one.

Enough has been stated to show that the elements or qualities of vocal expression, although properly receiving prominent attention, one at a time, cannot be completed in turn, one making way for another. The efficient teacher of oral reading must be well acquainted with the whole subject of elocution, he must be able to present along pedagogical lines the sections of each division of the subject adapted to the capacity and attainments of the respective classes. It is all the better that he is himself a good elocutionist if he avoids the danger line of relying too much on imitation. There are worse ways than that. "I give" said a teacher, "ten marks for perfect reading, six for pronunciation and four for minding the stops." But according to our definition this "perfect reading" was not reading at all.

Limits of space forbid the treatment of pitch, tone, movement, vocal gymnastics, etc., but there are two elements so appplicable to the reading of junior classes and so important throughout that they deserve special notice. These are imitative modulation and articulation.

Young pupils easily see the value and appropriateness of imitative modulation, and delight to practise it. The sounds of a surprisingly large number of words seem to harmonize with their meanings. Children are quick to perceive this fact when their attention has been called to it a few times. They may be easily shown the effect of the r's, in the stanza :

I'll make a terrible scarecrow, grim,
With threatening arms and with bristling head,
And up in the tree I'll fasten him,
To frighten them half to death, he said.
He fashioned a scarecrow all tattered and torn—
Oh, 'twas a horrible thing to see !

They will vie with each other in pronouncing *terrible, grim, bristling, frighten* and *horrible,* to make the sound enforce the meaning. Dr. Corson thinks it not improbable that Shakespeare voiced his language as he composed, so appropriate is the sound of the words to the thought they symbolize. We believe he is quite right, as the plays abound in examples of such appropriateness. If a person be reading Macbeth, silently, on coming to the description of the witches' caldron, the impulse to read the lines aloud and by explosive articulation to imitate the boiling pot will be well-nigh irresistible.

Double, double toil and trouble,
Fire burn and caldron bubble.

The Second Reader furnishes numerous examples for imitative modulation in, "Who Stole the Bird's Nest," "Good Night and Good Morning," "Robert of Lincoln" and "The Lazy Frog," but the best lesson in the whole series for this kind of exercise is, "The Story of a Drop of Water," pp. 144-151.

Articulation.—Not reading only, but all other recitations should be marked by insistence upon distinct articulation.

Articulation exercises suited to the advancement of the classes may be written on the blackboard or

dictated to be written by the pupils for subsequent reading. Some types of exercises are:—

1. Combinations of consonants difficult to articulate, *e.g.*,

sphere.	bursts.	rhythm.
length.	posts.	precincts, etc.
breadth.	elm.	

2. Words of which a consonant, vowel, or syllable is liable to be dropped, *e.g.*,—

reg'lar	for	regular.
rev'rent	"	reverent.
partic'lar	"	particular.
hist'ry	"	history.
etc.		

3. Additions or substitutions of sounds, *e.g.*,—

chimley	for	chimney.
drownded	"	drowned.
Toosday	"	Tuesday.
heith	"	height.
etc.		

4. Dropping final sub-vocals and aspirates, *e.g.*,—

fren's	for	friends.
ac's	"	acts.
an'	"	and.
askin'	"	asking.
etc.		

5. Indistinct separation of like sounds coming together,—

whole lot.
fresh sheet.
till late and till eight.
an ice-cold drink and a nice cold drink.
etc.

6 Provincialisms used by pupils and the jumbling together of words in common phrases,—

as idear for idea.
mebbe for may be, etc.

A prevalent error—that the sole use of oral reading is to communicate thought to others—has stamped itself on our educational practice. Much of the finest poetry as well as impassioned prose has to be vocalized to be properly appreciated. The thought or the emotion is richly enhanced by the effort of giving it appropriate utterance and hence the cultivation of the reading voice becomes a means to a noble end. Dr. Corson rightly places a high value on that early attunement of the sympathies to good literature which begets an inward impulsion to vocalize whatever one specially enjoys in his reading. Indeed, he places so high a value on reading aloud that he affirms, presupposing the requisite vocal cultivation on the part of the student, that in literary examinations, a sufficiently qualified examiner could arrive at a more certain estimate of what a student has appropriated both intellectually and spiritually of a literary product by requiring him to read it aloud than he could arrive at through any amount of catechizing.[1]

As the teaching of literature is the subject of another chapter its important bearings on the reading-lesson will be but briefly referred to here. Much that passes under the name of literature in the junior and intermediate classes is not properly named,

1 Corson's *The Voice and Spiritual Education*, p. 55. This little book is well worth careful reading.

e.g., the mere defining of words and phrases sometimes called "meanings." Defining is, however, an important part of the instruction in reading and gives the teacher opportunity to exercise tact and skill. Of the common methods in vogue the worst is indicating a list of words of which dictionary definitions are to be written and then memorized. As a usual exercise a certain class had written and memorized such definitions of the assigned words in the lesson on page 122 of the Third Reader. One of the words was *cleave* in the line—"Tis because they cleave unto a familiar, favorite few." The definition learned was "To divide by force." On being asked to write an original sentence using the word *cleave*, one girl wrote, "She cannot cleave her sum." Pages could easily be filled with accounts of similarly useless and ridiculous results of a rather prevalent way of teaching (?) "meanings." Where practicable, the context in which a word is used should be studied to disclose its meaning. When it is not possible to discover the meaning from the context the teacher will have to decide whether to refer the pupils to the dictionary or to explain the word himself. The dictionary is a necessary book and every pupil in the Third Class and upwards should receive instruction in its proper use, not only to discriminate among definitions, but also to interpret diacritical marks and contractions.

In illustration of some of these principles and suggestions take the lesson in the Third Reader: "A Wet Sheet and a Flowing Sea"

A WET SHEET AND A FLOWING SEA.

Allan Cunningham.

A wet sheet and a flowing sea,
A wind that follows fast,
And fills the white and rustling sail,
And bends the gallant mast;
And bends the gallant mast, my boys,
While, like the eagle free,
Away the good ship flies, and leaves
Old England on the lee!

"O for a soft and gentle wind!"
I heard a fair one cry;
But give to me the snoring breeze
And white waves heaving high;
And white waves heaving high, my boys,
The good ship tight and free,—
The world of waters is our home,
And merry men are we.

There's tempest in yon hornèd moon,
And lightning in yon cloud;
And hark the music, mariners,
The wind is piping loud!
The wind is piping loud, my boys,
The lightning flashes free,—
While the hollow oak our palace is,
Our heritage the sea.

The teacher's spirited reading of this short poem will cause the pupils to admire it. The movement, music of its language, and sentiment will win their favor. But there are terms in it that land boys will not understand or will misinterpret. The beauty of the piece is enhanced by weaving it around distinct and correct images. Therefore before the oral

reading is practised some defining work should be done. In this connection it is worthy of remark that pupils may grasp the thought or sympathize with the emotion in a passage containing words that they cannot define or do not understand, and per contra, they may understand or be able to define every word in a passage and yet fail to grasp the thought of the whole. The sentence is the unit of meaning. Pupils are pretty certain to suppose that "sheet" means a sail, hence they are not likely to search for its meaning, indeed, looking up the word in the dictionary may confirm their erroneous supposition. This is, therefore, an example of a word that the teacher should explain. He should tell what the sheet is and try to draw from the pupils, if possible, the effect of its being *wet*. After the explanation the unabridged dictionary might be consulted with profit. In like manner "flowing sea," "hornèd moon," "piping loud," "hollow oak," and "heritage" should be explained or developed. The efficient teacher guards against doing for the pupils what they can be got to do for themselves, hence he refers them to the dictionary for "gallant mast," "lee," "tempest," "mariners," and "palace," and requires them to define by studying the context—"my boys," "fair one," "heaving," and "music." Of course the context has to be kept in view throughout, whether the assistance in defining be from the dictionary or any other source. This rule is most emphatic. For example, one dictionary defines "palace" as "the residence of a sovereign; any magnificent building." The chief value to the pupil from the study of this word is the exercise afforded in reaching the

conclusion that it is the kingliness of the sailor in the situation described rather than the magnificence of the good ship that makes his home on the wave a palace.

No rule can be prescribed for determining the extent to which verbal explanation should precede the oral reading of a lesson. Excessive verbal dissection of a piece of literature usually gives aversion to it rather than affection for it. An elocutionist before an audience would seem ridiculous if he interpolated verbal explanations as he proceeded with his reading. He relies, or should rely, on his voice to interpret what is not conveyed on the surface by the words. "A susceptible reader," says Dr. Corson, "on the first reading of a poem or an impassioned prose composition, will be more or less immediately responsive to the key-note of the composition. An increased familiarity will finally bring this key-note fully home to his feelings or as fully as may be; and if he has made the articulating thought his own, he is prepared to interpret the composition to the ears of others."

To get the best results from the lesson under notice, which, it must be remembered, is poetry, and therefore in some respects should receive different treatment from a prose lesson, the teacher's reading or the pupils' practice and study will come immediately after such explanations as are necessary, to clear the ground of misconception or total obscurity. The best practice for the pupils will be oral, and that usually has to be done at home. In such a lesson as this it is far more important that a pupil should leave it with a love for it even though

he cannot explain all the terms used in it, than that he should leave it able to define every word, but careless whether he ever sees or hears the poem again.

The dragging in of every verbal relevancy is another prevalent fault. To illustrate, I quote part of an examination paper based on this lesson: 1. Tell what you know of Allan Cunningham. 2. What sea was meant? 3. Why is England called *old?* 4. What is the cause of lightning? 5. Spell and define homonyms of *see*, *lee*, *our* and *fair*. Is it too much to say that not one of these questions should occupy any attention whatever in the teaching of this lesson. Suitable questions, as a rule, are answerable solely from a searching study of the text.

A less prevalent, though not less serious fault, is a disposition to search for and dwell upon flaws in statement or construction. Dwelling on such questions as whether the shore in the case was on the lee, and criticizing the association of the hornèd moon with the tempest, repels the pupils instead of attracting them.

The treatment of the lesson, on the contrary, should be constructive. It should aim at stimulating the imagination to create a succession of pictures,—first, the good ship fleeing before the wind; second, a vessel heaving high on the white-crested waves; and third, a palace on the boundless water amid the grandeur of lightning and storm,—and at the further exercise and cultivation of the esthetic sense by attention to the suitability of the language and the melody of the composition.

Now we come to the fault most common of all, viz., piling Pelion upon an Ossa of defining and explanation, making so much preparation to read that no time is left to do the reading. If the teaching of reading must be one-sided, let it err on that of too much practice at the expense of explanation. There should be plenty of spirited practice, at home if not at school, (*) in giving vocal expression to the thoughts and emotions the lessons are intended to convey, and that with conscious, daily increasing regard to the elements of time, pitch, quality and force.

The culmination of the defining, explaining, silent reading, constructive criticism, and mental imaging is this reading aloud by the pupils. A short poem like this may be read throughout by several members of the class during the recitation period, the others all receiving an opportunity to read some part. On the side of elocution, selected parts should receive special attention. For example in :—

"O for a soft and gentle wind !
I heard a fair one cry ;
But give to me the snoring breeze
And white waves heaving high,"

the teacher will take advantage of the excellent opportunity the quatrain offers for imitative modulation in "soft," "gentle," and "snoring;" for emphasis by time in "soft," "fair," "snoring" and "white waves heaving high;" for emphasis by force in "fair one" and "me;" and for varying force,

* I have seen a class practising in summer weather under the shade of a tree near the open school window.

movement and pitch in each of which qualities the second line varies from the first and from the other two. At this stage the elocutionary elements themselves and not the names would receive attention.

In poetry correctly read, a measured flow is heard which distinguishes it from prose. That measured flow must not be confused with a chanting sing-song utterance easily and often acquired. Poetry is better read as so much prose than in the latter manner. Correct pronunciation and accent must not be sacrificed to eke out a poet's limping measures or defective rhymes.

The school Readers will, of course, be the main reliance for the subject-matter of the reading-lessons. It is fortunately, now, as easy as it is desirable, to obtain an adequate supply of suitable supplementary reading. But it should not be overlooked that every text-book in the school is to some extent a reading-book. The proper assignment of a lesson in history, for example, consists largely in directions for or assistance in the reading of the prescribed pages of the text-book.

To sum up.—An intelligent application of the principles set forth in the first part of this chapter on the lines of the inductive-phonic method duly infused with energy, diligence, and sympathy will carry the class quickly and pleasantly through the mechanical-mental introduction to reading. To the pedagogics of the succeeding part the teacher should bring a good academic training in literature and elocution. His success will be largely measurable by the extent to which his pupils are taught to appropriate the

author's thought and feeling by that species of analysis, construing and discrimination going on as silent reading, and by the way in which he seizes and builds upon the natural impulses to give the suitable qualities of vocal expression to what they know and feel.

In conclusion we quote the standard directions given to his students by Prof. Monroe, Dean of Boston University School of Oratory :

1. *Stand or sit in a good position.* Body upright, chest expanded, shoulders thrown back, head erect.

2. *Hold the book properly.* Support the book in the left hand, with three fingers beneath it, the thumb and the little finger extended above to keep the leaves down, elbow free from the body, and forearm elevated at an angle of thirty to forty-five degrees.

3. *Breathe before the lungs are empty of air*, and before necessity or fatigue forces the lungs to inspire too great a volume at once.

4. *Keep the eye and mind in advance of the tongue.* That is, look ahead on the page, and see and understand clearly what you are going to say, before you speak.

5. *Think the thoughts and feel the emotions.* Unless this is done the reading will be as profitless to the reader, as it is dry, mechanical and meaningless to the hearer.

6. *Be in earnest.* Always throw yourself into the spirit of what you read and try to do your best.

7. *Make yourself heard, understood and felt.* Do this without overstraining the voice or pitching its tones too high.

8. *Listen to others.* Strictly attend while others

are reading; try to see wherein they do well that you may make their merits your own.

9. *Study the Reading-lesson.*— Prepare your reading exercise as carefully as you would for a recitation in any other subject. The productions of the great masters of thought and expression cannot be read properly without much study.

CHAPTER VI.

GEOGRAPHY.—PART I.

THOUGH eminent educationists have done much in recent years to spread abroad true ideas of the real nature of Geography and of the right methods of teaching it, yet it is but too evident that a great discrepancy is commonly found between such principles and the ordinary practice of the schools. Too frequently has its scope been confined to location and statistics, with elaborate map drawing as its great display and long lists of empty names as its chief result,—to the utter disgust of the child and the dwarfing of his intellectual faculties.

Chief among the causes that have prevented a more intelligent treatment of this subject may be mentioned (1) The lack of a right conception of its nature and purposes; (2) Too great a dependence upon text-books, as well for the order as for the substance of the lessons; (3) The pressure of examinations, leading to the cramming of those facts and names judged likely to be asked for; (4) The dwelling upon unimportant details so that the main principles are lost sight of.

The purpose of this brief sketch is to offer, especially to such teachers of junior classes as aim at something better than mere memory work, some aid in raising this subject to a higher plane, making it at the same time both educative and practical.

Scope and Aim—On account of its more or less intimate connection with Geology, Botany and other sciences it is not easy to define strictly the scope of this subject. But the following quotation from Geikie gives a pretty comprehensive view of its extent and purpose: "It seeks to present a distinct and luminous picture of man's surroundings—the earth he walks upon, the air he breathes, the waters that fertilise his fields, the ocean that bears him from continent to continent, the living things that minister to his enjoyment alike on land and sea. It selects from the various sciences . . . . those facts and conclusions which bear most closely upon the well-being of man, or which enable us most clearly to comprehend the general plan of the marvellous creation wherein we form a part. It is the special function of Geography to direct our attention . . . . to the ever changing phenomena that surround us and influence our daily life; to increase our knowledge of the country we live in, and thence to trace analogies and contrasts among the aspects of nature in other regions of the globe. Geography compares the topography of one continent with that of another, dwelling upon the fundamental elements of each, and showing how they have affected the distribution and development of the human population . . . . Connecting the endless diversity of local detail with human history, Geography notes how largely it has influenced the progress of human events, how, for example, it has directed the migration of peoples, guided or arrested the tide of conquest, moulded national character, or given its own coloring to national mythology and literature. Geography further contrasts the climates

of the globe, calls attention to the varying phases of plant and animal life by which they are accompanied, and traces their influence upon the march of discovery, and the spread of civilization and commerce."

Observation the Foundation—Assuming, then, that our object is not to teach the surfaces of maps, (which for the pupil bear little relation to the reality), but instead to build up a clear conception of the earth's surface and its relation to man, how shall we proceed? It must be evident that if the child cannot see and understand what comes under his own eyes, he can form no adequate conception of what is distant and unseen. But "Every school district is a world in miniature, for it repeats the structure and story of its life in pictures so vivid and language so simple that every child may see and read." It is all important then that the starting point shall be that district with which a child is familiar, and that the knowledge be gained by himself direct from nature and not through books. The method here advocated may be thus summed up:—observe, express, reason.

To carry out this plan it is best to begin almost at the very outset of the children's school life, and with subjects not generally recognized as intimately connected with Geography. The chief purpose should be to train pupils to observe clearly and thoroughly. The facts thereby gained may be of but secondary importance; but it is the *power* to observe that should be aimed at, and the *habit* of observation that should be cultivated.

The earliest lessons on the familiar things in and about the school, their home and the immediate vicinity, will of necessity be somewhat superficial and

disconnected, only the most elementary and obvious facts being asked for. When the limit of the children's knowledge has been reached, the whole should be given in connected form, the teacher adding such new facts as he deems necessary to a clear understanding of the subject and within the easy grasp of the pupils. But there must be no attempt to force them to see through the teacher's eyes,—rather should he follow their line of thought than attempt to lead them. What a child discovers for himself, is many times more valuable than if got through hearing or reading. The questions should be so framed that to answer them the child must have seen and noted something. This is a great stimulus to examine things closely, and notably encourages some pupils who may not shine in other studies. Constant repetition and revision are necessary until the class has thoroughly mastered these fundamental notions. Yet these reviews should never be identical in form with the first lessons. New aspects of old facts give clearer insight and greatly aid in fixing them in the memory. Provided a teacher is thoroughly familiar with this subject, all forms of land or water should suggest numberless questions,—comparisons, differences, causes, effects, etc.

Advantages of Rural Schools—Schools in the country are the most advantageously situated for this work. There, the natural appearance of land surfaces, little changed by man's action, offers the best opportunities for the study of hills, valleys, plains, streams, watersheds and the circulation of water over the land. The tilled fields, the neglected common and the woods afford varied

examples of vegetation; while different types of animal life can be seen in their natural habitat.

With such abundance of material for stimulating observation and reasoning, it needs only that the school should turn the child's attention to these things to have him appreciate nature through his own senses and not as described in the dry pages of a text-book. The "Barefoot Boy" should more commonly realize Whittier's conception; for when

> Hand in hand with her he walks,
> Face to face with her he talks,

then indeed "Nature answers all he asks."

Course in Town Schools—In towns, attention will naturally be directed more strongly to the humanistic side, but all the forms of land and water within each reach should be carefully studied. The earliest lessons might well include visits to the markets to note what farmers offer for sale; the chief local industries,—raw materials, process of manufacture, disposition of the finished product; the public buildings with their location and purpose; the railways,—freight carried to and from town, direction of road, neighboring places on the line, other means of locomotion; building materials, where got, how prepared, etc., etc. There should be a series of lessons on the common food-plants, *e.g.*, wheat, corn, rice, coffee, etc.; on the materials used for clothing, *e.g.*, wool, silk, cotton, etc.; on the life and work of farmers, miners, lumbermen, sailors, etc.

But even in towns there is fair opportunity for observing natural phenomena. The various forms of water,—mist, fog, clouds, snow, ice, hail, dew, etc.,—

may be seen; and their causes and effects explained when the pupils have been properly prepared. The rising and setting of the sun, the varying length of night and day, heat and cold, the position of the sun in the sky, the changes in the moon's aspect, the direction and force of winds, the broad expanse of the sky dotted with bright stars and their movement across the heavens, the appearance of the Great Bear and location of the North Star, etc., etc.,—all may be noted in the town nearly as well as in the country. The varying seasons should be remarked, as spring with lengthening daylight, increasing warmth, the opening of buds, the return of birds, and reappearance of animals,—in a word, the awakening to new life of much that was dormant during the cold season. In a later stage of the course the causes producing such changes will be developed, if possible from the pupils themselves.

And with earnest, resourceful teachers much can be done even in towns to study plant and animal life. Parks and gardens offer much material; flower beds and window boxes may be planted and cared for by the pupils; grass or flax seed may be sown in wet cotton or a sponge; a sweet-potato vine may be grown in a glass of water, etc. Simple experiments will show the differences in vegetation caused by light, heat, moisture and soils. Types of several forms of animal life are easily within reach, and are of much interest if rightly studied. The wonderful changes that a caterpillar undergoes should arouse the intelligent curiosity of any class. It is not intended that the teacher should be a botanist or a biologist to conduct such teaching successfully, but

only that he should have some personal acquaintance with the subjects of his lessons, and not base his teaching wholly on books.

Cultivate the Imagination — In connection with observing, the power to imagine should be carefully cultivated, for the purpose of this teaching is not chiefly to make familiar the land and water forms, the plant and animal life of the district, but rather that, by appreciating what thus falls under his own eyes, the child may be enabled to picture the great world beyond his small horizon. This he can do only through his imagination, which is not a creative process, but only a working up of old experiences into new. Our concepts of the earth depend, then, upon what we have seen and understood of that part which has come within our view. As the pupil's field of observation must necessarily be very limited and his examination of it rather imperfect, he must rely chiefly upon the work of others and their presentation of it, for his knowledge of the vast world,—hence one great reason for developing imagination at this stage. When the familiar brook and meadow have been studied, the teacher should endeavor by pictures, oral description, and other means of illustration, to have his pupils imagine, *e.g.*, the great Mississippi, whose type they have just examined. Similarly the neighboring hills are used to build up ideas of the Alps, while a field of sand on a hot and windy summer's day may suggest the great Sahara, and the pond of a few acres broaden out into Lake Ontario.

Illustrations of Method—Within the narrow limits of this sketch it would not be possible to give

full details as to the carrying out of this method. The varying conditions of each locality must largely determine the order, and to a certain extent, the treatment of the subjects. But even a few imperfect illustrations may be of some service.

If the weather has suggested "rain" as an appropriate lesson for the day, even the youngest pupils may be asked what rain is, where it comes from, its appearance in falling, on what kind of days it comes, what becomes of the part falling on the soft ground, that falling on the hard road or path, the appearance of the grass and plants after showers, etc. When they have acquired more information the subject is again taken up and they may study what became of the water that sank into the earth, its use to plants, how it again reaches the surface, where it then goes, etc., etc., to lead to an understanding of the circulation of water over the earth's surface. At a later stage they might be questioned as to what becomes of the water when wet things dry, under what conditions drying is most rapid, where the water goes when boiled away in a kettle, under what circumstances they can "see their breath," the moisture on a pitcher of cold water in a warm room, the "frost" on window panes, in cold weather, etc. Thus, gradually, they may be led to grasp the wonderful circulation of water between the earth and the air and its dependence upon the sun's power.

The neighboring brooks and streams should be studied with particular care, to understand the action of running water and why the land is organized into slopes. The pupils should find out where the water comes from, where it goes to, why it runs in a

particular direction, where its course is swiftest and where slowest, with reasons; the appearance of the banks and bottom; whether it is carrying down gravel, sand, or mud, and which of these prevails and why, in a certain part of its course; how it appears after a heavy rain or melting snow; where it is eating away its banks and the cause; whether it spreads silt over the land; where it has formed pools and the reason; what effect on its course an obstruction or a hard bank has; what is the life in its stream or along its banks, etc., etc. From the sticks or logs floated on its surface they will see its carrying capacity, and if water wheels are found along its course they will have a demonstration of its power to move machinery. How shall we compare the ideas of running water gained from such teaching with what they learn from the useless repeating of the definition, "A river is a stream of water running through or over the land," when even the meaning of "stream" is not known?

Direction—In determining direction by the sun, neither the east nor the west should be the point of beginning, both because the position of the rising or the setting sun varies from day to day and because the opportunities for such observations are not favorable during a good part of the year. But the direction of the sun at noon is always the same, and the time for observing is opportune. An upright post four to six feet long, fixed in an open part of the ground, should have the length and the direction of its shadow marked by the children at, say, nine o'clock, noon, and four o'clock. The relation between the length and direction of the

shadow and the position of the sun should be clearly seen. The length and the direction of shadows cast by telegraph poles, trees, persons, etc., should be noted, until the pupils can readily infer that at noon the shadows are shortest and point always in one direction. The names "south" and "north" may then be given. Either in the yard or on the school-room floor a due north and south line should be drawn, with another at right angles to fix east and west. There should be many exercises, varied and repeated, until the pupils can readily determine the directions of places and objects from one another. Later on, they should learn how to tell direction by the north star and by the mariner's compass.

Measuring Time; Change of Seasons—Observations of the sun's apparent course should be continued, to show how time is measured and on what the change of seasons depends. The measurements of the post's shadow should now be as exact as possible and should be recorded at intervals of about a fortnight. The children will watch with great interest the gradual lengthening of the noon shadow from the summer solstice until it attains its greatest length at the winter solstice, and then its shortening till it again reaches the exact measurement recorded on the 21st of June of the preceding year, when it once more starts to lengthen. The precise length reached at the time of the fall and of the spring equinox should be noted and compared, as also the hour of the rising and the setting of the sun then and at regular intervals throughout the year. The characteristic features of each season should be duly remarked, as winter with its short daylight, its

cold and snow, the absence of vegetable and much animal life, etc., etc. They may thus be led to appreciate what we mean by day and year, and how each comes to be a standard measurement of time. Even from their own short experience they can readily recall that day has followed day, season followed season, and year followed year, and will understand that the same ceaseless succession took place in the past and will probably continue in the future. The important matter is to have them connect such succession with the position of the sun in the heavens, and then, but not till then, should be unfolded to them the wonderful truth that this earth is but a great ball constantly spinning on itself and going around the sun. Time and effort should be spent and all simple means of illustration employed to make clear this great step in the child's progress which conflicts so much with his early impressions.

Estimating Size and Distance — The junior grades should be taught not only to determine relative position but as well to estimate relative distance and size. In dealing with the larger divisions of the world, the figures used have little meaning for children because the terms are practically unfamiliar. How can it help them to conceive the greatness of the Mississippi to say that it is four thousand two hundred miles long, if "thousand" and "miles" are to them but empty words? But the distance between two well-known points, say in their walk to school, should enable them to appreciate "mile." Many will have gone to places some miles distant, say, to a town ten miles away. Such a unit would be of service when dealing

with large areas or distances by having the class observe how small it is relatively. To estimate how long it would take a railway train of average speed to cross North America at its widest part would appeal more forcibly than to give its distance in miles, especially to those who have travelled by train. Should there be a familiar hill requiring say twenty minutes to climb, this might be made the unit, and pupils will better realize the great height of some mountains if told that it takes days to reach their summits, or that their tops stretch higher than the clouds they see, rather than to state their height in feet or miles. When the size of other towns or cities is to be given, their own should be made the standard; other counties and countries should be compared or contrasted with their own. Instead of giving dry and often meaningless figures use *familiar* units whenever possible, and also make appeals to the eye by simple diagrams.

Subjects of Study—Lack of space prevents any but a brief reference to other subjects of study. But some consideration should be given to locomotion by water and by land, the advantages of each, which was earlier; the reasons for the location of railroads, either on account of the nature of the surface, or the centres of population; the condition of communities to which access is obtained by roads alone, by roads and by rail, or by roads, by rail and by waterways. Some attention should be given to the distribution of population in the vicinity,—how the numbers and grouping of the villages and towns are dependent upon the fertility of the land, the richness of the mineral deposits, or the advantages for commerce,

manufacturing, etc. Some simple ideas should be gained of industries and commerce, and whatever industries the district may be noted for should receive special consideration. These observations, which later would lead to an intelligent understanding of climate, should not be neglected, especially as the simpler parts of the subject are very attractive to children. Differences in temperature, how indicated by the thermometer, their dependence on the sun, winds, elevation, etc., might well be considered in so far at least as they can be judged from local conditions. In some schools it is the practice to have pupils mark the readings of the thermometer at stated hours, and a record is kept of the year's temperature. The construction of the thermometer should be explained when the pupils are prepared to receive it. The number of bright and of rainy days might be noted, with the prevalence of each during the different seasons; the amount of rainfall might also be estimated if convenient. The direction and velocity of the winds might be remarked, noticing from what quarters come the warm winds, the cold winds, those that bring rain or snow, etc. Atmospheric pressure is a difficult subject, and along with a full treatment of climate, may well be reserved for a more advanced stage.

Excursions and Field Lessons are of great value, though often difficult to carry out successfully. Yet on holidays or outside of school hours it could probably be arranged to have the pupils, in class or groups, view from a hill-top, or other commanding point, the surrounding country. The hills, streams,

lakes, islands, roads, etc., would be observed, and described in simple language, their directions and distances estimated, their names given, and so far as may be, their relations studied. The main and lesser divides could be traced, noting whether vague as on a plain or sharply defined as on the crest of a ridge; the slopes leading from these divides to the streams examined as to whether they are gentle or abrupt, long or short, smooth or rough, etc. Attention might also be directed to the arrangement of the streams and the drainage areas, the size of the streams and the area of the surface drained, etc. Such a " bird's eye " view is worth more than maps, models or mere descriptions, if the teacher knows how to use it.

Denudation—The slow wearing down of the land surfaces should be studied in the action of rain, frost, brooks, etc., in breaking up or carrying down to lower levels,—the active movement on steep slopes, the slower rate on flat surfaces, on which the waste accumulates often to a considerable depth. The slight wasting during dry summer or steady winter weather, the great activity during rains and in spring and fall when thawing and freezing rapidly alternate, will be remarked. The great quantity of waste borne along by many streams, especially during flood times, and the action of ponds and lakes in allowing the waste to settle and discharging the water purified; the growth of deltas in favorable places,—all should be noticed. In time pupils will understand that all soil is but waste from the great store house of the rocks, resting on its way to the ocean. It may be advisable to offer suggestions and explanations in regard to many geographic forms, if it can be done

so as to convince pupils of their essentially simple character. At a later stage they should fully appreciate the fact that the present geographic features have not always existed in this form, but that they are the result of long-acting processes, and are being constantly modified. The older treatment of this subject was empirical, exercising the memory but not the reason; the later teaching is more rational, for geographic forms when understood are more easily retained in the memory than when meaningless.

Modelling—Pupils should not only examine all surface forms in their neighborhood, but it is equally important that they should represent them. The educational maxim that "there is no impression without expression" applies here with especial force. The expression by language, moulding, drawing or by all these means, leads to greater clearness in observing, for, in the endeavor to combine and represent his mental images, the pupil quickly recognizes the limitations of his knowledge. Though moulding or modelling is not so easily provided for or so generally used as is drawing, yet the earnest, resourceful teacher could readily find means if only he recognized the great value of the work in representing form and relief. It is not intended that nature should thus be *taught*, for a child should, whenever possible, get his ideas from the real hill, the field or the stream, and so have true pictures of these; the sand model is only a means of reproducing his perception of the reality, and is laid aside as soon as pupils have clear ideas of forms, and can imagine them in other relations than those seen by the eye.

The earliest lessons may aim at emphasizing but one chief feature, *e.g.*, a neighboring hill; but gradually the representation may include additional features. If suitable pictures or diagrams are at hand for illustration, the pupils may model other topographical features not found in the district. It is decidedly better to reach conceptions in this way rather than by the rote learning of definitions.

When the teacher uses the sand or moulding board his work should always be done in view of the pupils, largely by their aid and subject to their criticism. Time and effort should not be wasted in striving for perfection, though fair accuracy should be aimed at. If possible the school district should be represented in relief in some more stable material than sand. From the school as a centre, all points of interest in the vicinity should have their distances and directions determined by the pupils, and the map be built up part by part during six or eight weeks. In this or other models the vertical scale should not be *unduly* exaggerated or a false impression will be given.

Maps and Map Drawing—Of great value in this subject is the ability to read maps well, for a good map shows the chief geographic features and their relations more clearly than would pages of description; and undoubtedly the best way of learning to read maps is to begin by making them. In schools where drawing has been intelligently taught through a study of objects and by the aid of the board, the beginnings of this subject will present little difficulty. Probably it is best to start with a plan of the school room, showing the four walls and

the position of the doors and windows. In subsequent attempts further details may be added, while the scale is varied. All measurements should be made by the class and then reduced to the scale chosen. Later efforts should show the schoolhouse and grounds. Then the district, which has already been represented in a model, should be mapped on the board. In this way the two means of representing geographical features are associated from the outset. The signs used should be those found in the best maps. Thus taught, each sign readily recalls a clear, because familiar, concept; after some practice pupils will be able to interpret map language readily and to form a fair mental picture of the country so portrayed.

The same principles should govern throughout the course. The first maps of a continent should, if possible, be drawn from a raised model, so that pupils should all along associate outline with relief. They should be led to see that coast lines show the limits where the continental slopes rise above the level of the ocean, and that the same slopes are continued below the level of its waters. In such maps no effort should be wasted on details, but all attention should be centred on the outline and general proportions. The first maps of North America, for instance, should show but few coast irregularities; it would suffice to mark only Hudson Bay, Florida, Gulf of Mexico and Alaska. Later on, further details may be added.

Contrary to the usual practice, the early maps should occupy less time in their drawing than would the later ones, both because there is less detail and because the whole attention should be given to grasp

and to express the *general* proportions. With the relief map in clear view of all, as many as can be so accommodated take places at the board; the others work on paper at their seats. At a word of command all start, and the sketching is limited to about half a minute. After criticism the maps are erased and other trials made, until a creditable sketch can be produced by the majority, within the time limit. Subsequent lessons should review the work already done and add such further details as are of importance. When one country or continent has thus been treated, the others should be studied by comparison with it and with one another as to form, area, coasts, etc. In connection with this work the teacher should ask suggestive questions, which may be answered from the map, *e.g.*, In what direction is the continent longest? Where is it broadest? What is its general shape? Compare as to outline and size with others previously learned. How does the greatest length compare with the greatest breadth? Which coast line is the longest, the shortest? Which coast is the most regular? the most broken? Give the chief indentations in the order of size, etc.

There should be frequent practice in sketching *without* the model, to see what the pupils can accurately reproduce from memory as evidence of their real knowledge of outline, surface, productions, location of cities, etc.

The chief value of this branch of our subject is its employment as a means rather than an end. The production of beautiful and elaborate maps, merely for the sake of appearance, but with little regard to the means used, is to be strongly discouraged, as

being of little educational worth. The great aim should be to lead the children to acquire correct ideas of the surface under consideration, and to express such concepts in a clear and simple form. But this cannot be done when the maps are traced through thin paper, or when instruments and elaborate construction lines are used, for then all attention is fixed on producing an exact copy, rather than on studying the form and relations of the original. But when the pupil makes his own discoveries of the relative length and directions of coast lines, of the trend of the watersheds, etc., such knowledge is of value, not only in that particular instance, but also to stimulate to a close examination of other land forms.

Except when the general shape and boundaries are to be studied, the use of the prepared outline map is often advisable, economizing time and effort, and giving an accurate foundation for the special matters to be considered. Some such maps are left to show clearly but one particular subject, *e.g.*, vegetation, others grow from day to day as the study proceeds. Such exercises are not to be carelessly cast aside, but carefully kept,—the pupil thus having in a clear and striking form the record of much of his work in this subject.

For teaching purposes the common wall map is of but little value. Instead the teacher may use stencils, or better, practise rapid and correct sketching on the board, the pupils filling in their own maps as he proceeds. Some of the maps most frequently used may be outlined in dark paint on the boards, or if these are small, on linen or heavy paper. By means

of simple diagrams on large sheets of manilla paper, many striking illustrations of various facts can be presented in a clear and impressive form,—relative areas, density and distribution of population, extent and value of the chief productions, the amount and kind of exports to or imports from different countries, etc.

The County—Before entering on a wide field it may be advisable to make imaginary journeys to districts beyond the immediate neighborhood of the school but yet more or less known to the children. If a good map is available the county might become the subject of study. Such trips could be made by following the course of the roads, the railways or the streams. There should be nothing in the nature of tasks to be mechanically learned by heart, but instead the pupils should be encouraged and directed to discover what the map may reveal or to contribute facts gained by themselves. The course of the streams should be observed, and they may be followed upwards to their sources and downwards to their outlets, their area of drainage determined and the watersheds located. The general configuration of the surface, the nature of the soil, the means of communication, the dependence of the products and the industries upon the character of the surface, etc., should all be carefully studied. There should be a judging of areas, direction and distances, a comparison of valley with valley, stream with stream, etc.

When the school district and its environments have been carefully studied, the scattered and isolated facts thus gained should be collected and classified in order that their significance and mutual

relationship may be clearly perceived. It is a correct pedagogic principle that facts should be seen and understood first as facts, before examining their causes and effects. While the surface and other geographic features of the district have been studied chiefly as so many unrelated facts, the numerous dependent relations existing among them should now be enquired into and made as clear as possible. In the early stages of study, pupils do not readily perceive the relations of things to one another; they more readily grasp the resemblances but must be trained to detect the differences as well. It would be unwise at first to point out reasons, and unwise at any stage to deduce general laws from too few data. It is only by the comparison of several streams, noting their points of agreement and eliminating their accidental differences, that pupils will be able to understand rivers *as a class*. They will have studied the formation of clouds, their movement by winds, the fall of rain, the welling up of springs, the flow of the water down slopes to the sea, before their wonderful connection and their dependence upon the sun's power are grasped. Reasoning is the last of the three steps yet in many respects the most important, for without it we could not apply what we have learned.

Country or Continent?—In determining the next step after the district and its environments, mere nearness in space should not count, but instead what is the simplest and most related to the preceding study. If the pupils have gained from observation true ideas of slopes and of their relations, they should be able to imagine other land areas made up of like forms,—the

clearness of the picture depending largely upon the simple or the complex arrangement of the slopes. On account of the detail involved, the adjoining county or one's province is more difficult to imagine than is a whole continent. The frame work of North America, for instance, is very simple, being made up of two great land masses, each having two slopes, with a great central plain and four great river basins. The continents, then, may be taken up when local geography has been exhausted; first our own, then, in the order of their simplicity of structure, South America, Asia, Europe and Africa. This study should centre chiefly on relief,—the great slopes and their arrangement relative to rainfall, drainage and heat.

Topics in Studying a Country

1. Position, etc.
   1. Latitude, longitude, hemisphere.
   2. Boundaries.
   3. General form.
   4. Size, absolute and comparative.
2. Physical features.
   1. Highlands.
      1. Mountains.
         1. Ranges.
         2. Direction.
         3. Slopes.
         4. Heights.
         5. Volcanoes,
      2. Plateaus, extent, elevation, effects, etc. [etc.
      3. Deserts.
         1. Causes.
         2. Effects.
   2. Lowlands.
   3. Draw profile.
3. Drainage.
   1. Watersheds.
   2. Rivers.
      1. Source and outlet.
      2. Direction, with reason.
      3. Size and use
      4. Branches.
   3. Lakes.

4. Climate.
   - 1. Causes.
     - 1. Latitude.
     - 2. Elevation.
     - 3. Mountains.
     - 4. Slope.
     - 5. Winds.
     - 6. Moisture.
     - 7. Currents.
   - 2. Peculiarities.
   - 3. Healthfulness.

6. Products and Commerce.
   - Chief productions in order of importance.
   - Localities where found ; preparation, use.
   - Leading exports, where sent, routes.
   - Leading imports, where got, routes.
   - Great commercial centres and facilities for trade.

7. Life.
   - 1. Vegetable.
   - 2. Animal.
   - 3. Human.
     - Races, population, occupations.
     - Language, civilization, customs, religion.
     - Government.

8. Political Divisions.

9. Striking characteristics.

10. Comparisons with our own and other countries already learned.

In the foregoing table an attempt is made to give in due order the topics in studying a country. It is believed that the general arrangement is a good one, though in some particulars it may be departed from at the teacher's discretion. The following outline of the study of our continent is based only in part on this order.

North America—An irregular triangular prism ; simple shape due to few centres of uplifting, chiefly two. On west, the Cordilleras, of complex structure, several parallel with some cross ranges, supporting lofty plateau, gradually rising from 800 feet in north to 8,000 feet in Mexico, in places a thousand miles in width ; now less than half the uplifted mass remaining, present denudation slow as rainfall

decreased; volcanoes at north and south. On east, the Appalachian system, from Newfoundland to Alabama; several ranges, generally parallel, lower and less well-defined than Cordilleras, and farther from coast, no volcanoes; some ranges old and greatly worn down; others (*e.g.*, Alleghanies,) of recent formation. Between these two systems lies great Central Plain, from Arctic Ocean to Gulf of Mexico, with scarcely a break; its area of arable land the largest of any continent. The Laurentian a third system, probably oldest land in continent, now much worn down, the waste has built up much of eastern district, difficult to trace trend of some of its ranges; now of but slight geographical influence.

On inner side slopes from two great highlands very gradual, Mississippi marks meeting place; arrangement of great land masses sends most of rainfall into great central plain; Height of Land and Great Divide determine its flow north or south. General land mass but little broken, compare with Africa, with Europe; effects? Hudson Bay and Gulf of Mexico conspicuous features, probably remnants of original central ocean. On northeast, numerous islands, separated by sounds, generally level, probably parts of mainland sunk beneath sea, form much changed by ice action; great mineral wealth, suitable soil, great natural advantages for commerce, but rendered useless by cold; fossil remains prove climate once much milder. Greenland, true form not known; except strip along south all covered with ice, thousands of feet thick, remnant of great ice age. Irregularities of east coast probably old, water-worn valleys, further deepened by ice, and depressed below

ocean. From New York to mouth of Rio Grande a fringe of small islands formed by wave action along gently sloping coast, protect mainland. Coral islands for about two hundred miles along Florida coast; southern mainland here of same formation and still growing south; effect on Gulf Stream? West Indies and Aleutians different from others; apparently summits of growing mountain ranges, many volcanic. Numerous deep, irregular bays, along southeast coast, probably formed by rivers when land was higher, then valleys lowered below ocean, now filling with silt.

Drainage—Four chief river basins, the Mackenzie, the third in size, the chief into the Arctic, valley but little known on account of great cold, apparently resembles that of Mississippi; stream freezes to bottom, thaws first towards south, causing floods and very irregular course in north; fed by many great lakes; of little use for commerce. But slight separation between valleys of Nelson and Mississippi; with but little portaging one can pass in a canoe at high water from one to another. St. Lawrence the second in importance; with possible exception of Nile the greatest lake-fed river; very steady flow; not descend by gentle declivity but by series of rapids or falls having great level stretches between; scarcely a trace of sediment and so but little cutting power and no delta.

Except Amazon, Mississippi has greatest length of water navigable for larger vessels; traverses territory with great differences of climate and rainfall, carries much mud, frequently changes bed, levees required some hundreds of miles from mouth, outlet by several streams, delta steadily extending.

The whole continent is particularly well watered, and streams so situated as to be of great service to commerce. Africa has more large streams, but within tropics and with great rapids. Asia has more navigable waters, but several empty into the Arctic. South America has about equal facilities but mostly in tropics with little variety of productions. The great number and area of fresh water lakes, a special feature unequalled in any other continent, resulting chiefly from glacial action; Great Salt Lake an exception.

Forests—When settled by Europeans, forests very continuous except in Mississippi valley. Appalachians hold finest forests of broad-leaved trees in world, but have also coniferous trees, "in no other spot of the temperate zone are the timber trees so varied or so useful," one of leading exports to Europe. Northward the number and the varieties decrease, north of St. Lawrence the firs predominate, but farther up cold stunts growth. Our Pacific forests begin where rainfall is moderate, thence towards north increase in number and area covered, later decreasing from cold, but reaching a thousand miles farther than on east coast; mainly cone-bearing, some species sequoia and redwood among largest in world, but few remaining. The palms and palmettos, the cyprus and live oak, worthy of notice.

The prairies probably once forest clad, but repeated burning of undergrowth and dry grass gradually destroyed trees.

The prairies, a characteristic feature, covered with coarse grass, and varieties of flowers, formerly feeding great herds of buffalo and deer, the abundance

of which kept aborigines as wandering hunters; rapid settlement of continent largely due to their easy tillage and great fertility.

Climate—All sorts from polar to tropical as land stretches from 10° to 80°; greater variety than in any other continent except Asia; four chief divisions, —frozen north, one-fourth of continent; arid region of Cordilleras, about one-fifth; tropical climate of extreme south; and great central region of medium temperature and rainfall. No protecting mountains at north to keep off Arctic winds, hence changes of temperature great and often abrupt; colder than Europe in same latitude, east colder than west, why? Gulf of Mexico a more important climatic factor than Atlantic or Pacific; much evaporation from great heat, prevailing winds carry the moist warm air far into interior, influence felt probably up to Great Lakes. Rainfall pretty evenly distributed over habitable portion, only about one-twentieth of continent really arid, irrigation employed. No extensive deserts as found in other continents, amount of rainfall in proportion to surface exceeded only in South America and Europe. Small area of perpetual ice and snow relative to other polar divisions, but Greenland is greatest known district of glaciers, its icebergs sometimes of several cubic miles may float a thousand miles south; effect on climate? A great part of coast subject to cold water currents, felt less on west as but narrow opening from Arctic: Gulf Stream chief counteracting agency; course? effects? Japan current aids on west; the west coast warmer and moister than east. Except Europe, North

America best suited by climate and general build to serve for highest development of human race.

Soils, of three classes, glacial deposits cover much of northern part, all that district once occupied by ice fields, not of great fertility but lasting; farther south, derived chiefly from underlying rocks, of different degrees of fertility, the limestone area being the most fruitful; the third are alluvial terraces resulting from overflow of rivers, the richest of all. The alkali plains in the west are the result of lessened rainfall.

The vegetation is very rich and of wonderful variety; besides maize, the potato and tomato, which are indigenous, all grains, fruits and roots known in the old world before America was discovered, thrive well in one region or another. While the polar regions sustain only stunted trees, lichens and mosses, the south furnishes the banana, sugar cane, palms and bamboos, and the intermediate temperate regions produce cotton, tobacco, rice and all sorts of food grains in great abundance.

Minerals—No other continent affords as great variety or richness of mineral products. There are three chief mineral belts corresponding generally to three chief mountain systems; that of Appalachians most explored, that of Laurentians but imperfectly known, while in Cordilleras there exists a greater and more varied store of mineral wealth (except fuel) than is found in any equally large area in the world. The coal fields of Appalachians, the most important, being easily accessible and extensively worked: the anthracite, produced in Central Pennsylvania, beds not over five hundred square miles in area but

usually very thick. Coal fields of continent originally much more extensive but became stripped away by sea and glacial ice. Abundance of copper in nearly pure state about Lake Superior; iron is widely distributed and extensively mined. In southern Appalachian region a peculiar advantage exists in coal and lime being found close to the iron. Oil and gas, resulting from the decay of animals and plants, exist in several though probably limited districts.

Commercial Advantages—In civilized communities it is of the highest importance to have ready access to the markets of the world for the necessary interchange of products. The location of our continent is most favorable for trade with the great commercial and manufacturing peoples of Western Europe, and through the Mediterranean with a portion of Asia. The Pacific offers easy communication with Eastern Asia and Australasia. The ice-bound condition of the north and northeast coasts shuts them off from much connection with the rest of the world; the shallowness of Hudson Bay is another obstacle. If water communication between the two oceans can be effected at the Isthmus of Panama, it will be a great aid to commerce. Ours is the great food-exporting continent, sending to the populous countries of Europe their chief supplies of grain and meat.

In so extensive a territory the necessity for suitable internal communication is as important as the means for trading abroad. One great advantage both for domestic and foreign commerce is the great extent of coast line and the numerous well-situated harbors. The system of internal waterways affords

great facilities for trade; the Mississippi is the most important, providing, with its tributaries, 35,000 miles of navigable waterways. The St. Lawrence and the Great Lakes furnish an excellent water route from the Atlantic to the very heart of the continent for a very large volume of trade. Though the Mexican peninsula has no great rivers, the country is in no part far from the coast. The Gulf of Mexico and the Caribbean Sea are of great commercial advantage by their position, affording, in connection with the Mississippi, ready communication from the great central plain to South America and the Antilles—one of the largest and most fertile groups of islands in the world.

The gradual slopes of the interior permit the easy construction of railroads, for even the Cordilleras are more easily crossed through passes than are the great chains of the old world. The wonderful variety of products in different parts of the continent furnishes abundant material for trade, domestic and foreign.

There is excellent provision for cheap and abundant power for manufacturing, not only from the great supply of fuel advantageously located, but also from the numerous streams having a considerable fall. The lake-fed streams of the northeast and towards the southern part of the Appalachians furnish a steady supply. There are few, if any, districts providing a larger and cheaper supply of power, and this region is likely to be the seat of still greater manufacturing industries, especially as the food supply is cheap and abundant.

Miscellaneous—To arouse interest and awaken sympathy it may be well to have the juniors study

child life in various countries. As a rule, children delight in hearing about the homes, games, food, dress and manner of living of those whose life presents a great contrast to their own. Illustrations, models, reading etc., may be freely used, so that they may have a vivid picture of the Indian boy, with his canoe, bow and arrows, of their little Eskimo friend clad in furs and living in a house of snow, etc. The dwelling on trivial matters, or those merely entertaining, should however be carefully avoided throughout the course; in all cases the aim should be important and the matter of value.

For convenience, definitions are grouped together at the beginning in most text books, but good teaching requires that they be taken up only as the subject demands, and if possible, be both discovered and framed by the pupils. If necessary, the teacher may suggest a better form, but he should remember that, as children are not critics of words, exactness of language does not necessarily imply clearness of thought,—which latter is the point to be aimed at. The real purpose of definitions is not to make mere parrots, but instead to develop perception, description and generalization.

A good sized globe, properly mounted, is indispensable, and should be continually referred to in order to correct wrong impressions likely to result from flat maps.

Aids for Teaching—There should be a cabinet of collections furnished largely by the pupils, to illustrate grains, woods, leaves, animal or insect life, articles of manufacture in their raw and finished state, etc. Too often these things

are mere names to the pupil. It is of great importance also to interest the pupils in making a collection of pictures, showing scenery, noted cities or buildings, houses, dress, productions, etc., etc.; arrange these by countries or subjects. Similarly, clippings from magazines or papers may be collected and kept in scrapbooks, properly classified. In the higher grades a geographical magazine should be subscribed for and other means taken so that obsolete or incorrect geography be not taught. It is essential to the most successful teaching to have pupils read suitable books of travel and use the information to expand and illustrate many of the lessons. Should the school lack a library of its own, some interesting books might be got from the public library. But it cannot be said that your teaching is the best unless you have stimulated the pupils to study for themselves, and in every way encouraged such efforts. It is advisable also to have some good works of reference for the use of teacher and pupils alike.

Text Books—Much of the unsatisfactory showing in this subject has resulted from a slavish dependence upon the text book. Not only was the matter of the book treated with religious reverence by being taught in its entirety, neither added to nor departed from, but the precise order of arrangement was also scrupulously followed. It needs but little consideration to show that while convenience dictates a certain order for text book arrangement, the best order for teaching is often a very different one. It is best to use no text book until pupils come to the study of particular countries, and then it should

be used rather for the purposes of review than of actual learning. But the books used by the child should be more than mere tabulated lists of countries and capitals, rivers, mountains, exports, etc., which is all that some manuals now contain.

Useless Details—A common fault which should be carefully guarded against is the giving of too many details of relief, outline, location, products, etc., and often without any connection between them. Teach only such forms and facts as are necessary to a proper grasp of the subject, and not as unrelated units, but as parts of a great whole. Can we cut down to fifty the list of cities to be remembered? The great commercial centres number less than that. Show the use of the atlas and gazetteer and spare the wearying effort to load the memory with useless details. Assist pupils to discover the influences affecting the growth of great cities, and the commercial relations of such cities to the surrounding district, and they will have more important knowledge than the exact size and location of the chief cities of the world.

Teacher's Qualifications — Accepting as true these views of the scope and aims of Geography, it is evident that not every one is qualified to teach it properly. An essential condition of success is a thorough, intelligent study of the subject to grasp its great principles and their relation. A wide range of reading is necessary, to have full and accurate information, with a large store of illustrations drawn from many sources. Above all, the teacher should have such a practical knowledge of his subject as mere reading cannot

give unless aided by reflection and personal observation. Thus equipped, he may free himself from the slavery to text books as well as from the bondage of tradition and habit, and shape his course according to the special needs of his class and his own individuality.

The subjoined list of books will be found serviceable; the writer has drawn freely on several of them.

Pupils' Books

Seven Little Sisters. Each and All. Stories Mother Nature told her Children.—*Andrews.*

Little Lucy's Wonderful Globe.—*Yonge.*

The World by the Fireside.—*Kirby.*

Madam How and Lady Why.—*Kingsley.*

Little Folks in Feathers and Fur.—*Miller.*

Two Years before the Mast.—*Dana.*

What Darwin Saw.

Our World Reader. No. 1. No. 2.—*Hall.*

Footprints of Travel.—*Ballou.*

Geographical Readers, various sets.

Teacher's Books

The Teaching of Geography.—*Geikie.*

How to Study Geography.—*Parker.*

Child and Nature.—*Frye.*

A New Comparative Geography.—*Meikeljohn.*

Comparative Geography.—*Ritter.*

Earth and Man. Common School Geography.—*Guyot.*

Physiography.—*Huxley.*

Physical Geography.—*Tarr.*

Story of our Continent. Man and Nature in America.—*Shaler.*

Methods and Aids in Geography.—*King.*

Methods of Teaching Geography.—*Crocker.*

The Realm of Nature.

CHAPTER VI.

(Continued.)

GEOGRAPHY.—PART II.—(MATHEMATICAL).

I. The Shape of the Earth—For the best results in these lessons, the teacher should be provided with a globe without lines of any kind upon it; for, one of the main purposes of the lessons is to show why certain lines are placed where they are upon a globe.

1. Make a dot on the surface of the globe and let a pupil start from this dot and continue in the same direction until the finger or pointer returns to the starting point.

Let another make the same experiment on the desk; another on the blackboard.

Then inform the class that a few hundred years ago people thought our earth flat, like the table or the blackboard. Ask what people in those days would naturally regard as the fate of one who ventured too far out on the ocean's surface. Then ask why we no longer fear such results. All are doubtless familiar with the fact that the earth has been circumnavigated.

As a matter of interest, ask for the name of the first circumnavigator. If they do not know, give an outline of the voyage and the change of view it brought about.

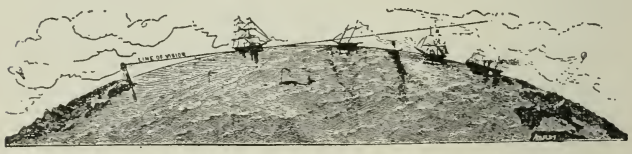
Now repeat the three experiments with which the lesson was introduced, and see if all realize what

bearing the circumnavigation of the earth has on its shape.

2. Place a toy boat behind the globe and gradually raise it, keeping the body of the boat in contact with the globe. Let the pupils tell what parts they see first, what parts next, until the boat is in full view.

Repeat and let the class tell why the larger part of the boat is not seen first. What shuts it out of view? Try the experiment on floor or desk when all parts are visible all the time.

Next appeal to the experience of the child. What has he seen first with a real boat on the earth's surface? Then let the class state the conclusion regarding the shape of the earth, to which this fact would lead. The class should then be trained to draw a diagram illustrating this fact.



Showing Rotundity of the Earth.

3. Stick three pins of equal length upright and in line on the desk or on some other convenient plane surface. Let pupils notice that the tops are in line. Stick the same pins not very far apart and in line on the surface of the globe. When the eye looks from the top of the first to the top of the third, the top of the second seems higher on account of the curvature of the globe. Now by placing three

poles of equal length vertically in a straight line at considerable distances apart on a level beach or plain it has been found that the top of the second, as in the case of the globe, is higher. Let class draw conclusion and then practise the diagram.

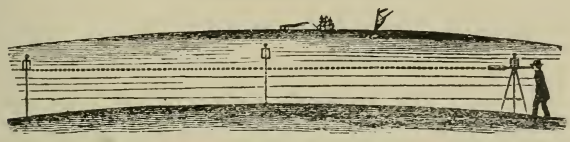


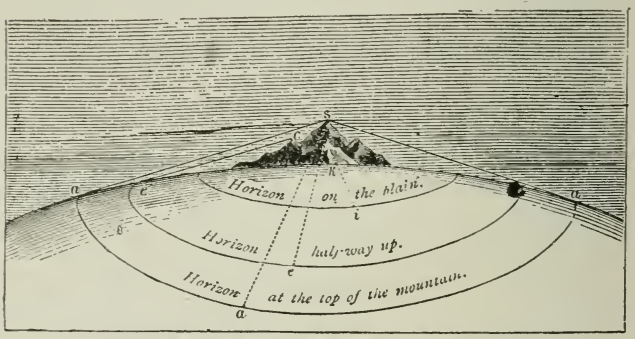
FIG 2. THE CURVATURE OF THE EARTH.

4. Let the pupils observe the shape of the shadow cast by a circular plate on a wall, a blackboard or a floor. They will notice that the shadow varies from a straight line when the edge of the plate is towards the source of light, to a circle when the plate is held perpendicular to the direction of the rays of light. Afterwards, try the sphere and the class will notice that the shadow is uniformly circular.

See how many of the class have observed an eclipse of the moon, and find what is their recollection of the shape of the shadow cast by the earth. Since the shadow has always been observed to be circular, they will, with the lesson of the circular plate and the globe fresh in the memory, draw the conclusion regarding the shape of the earth.

5. Take the globe again, and place vertically on it a pin or piece of wood, to represent a man. How much of the globe can he see? The class can be led to the conclusion that the limit of vision is formed by what we call tangents to the earth's surface from

the point of vision, and therefore the line between the visible and the invisible is a circle (Horizon). Let the pupils look about them when outside and see how on the earth's surface we have a similar circular boundary line. A good diagram is helpful here, as it shows why one sees a greater distance when in an elevated position. Bearing of this fact



ENLARGEMENT OF HORIZON BY ASCENDING A HILL.

on the shape of the earth? There are other proofs which do not lend themselves so readily to elementary treatment and yet are most convincing. They may be given in outline to the older classes. Two of these are :—

6. The weight of a body is practically the same at all points on the earth's surface, though slight variations are observed on the tops of high mountains, and even at the sea level in different latitudes, on account of the bulging out of the earth at those points. Then, the conclusion :—Since a sphere is the only solid on which all points on the surface are equally distant from the centre, the earth is spherical in form.

7. The pendulum really furnishes us with the most delicate test of the general sphericity of the earth, and the slight departures therefrom. The diameter at the equator is thus found to be about 26½ miles greater than the polar diameter.

II. The Size of the Earth—Teach the division of circles into quadrants and the sub-division of the right angles so formed into degrees.

By cutting an apple or orange through the centre, lead to the conclusion that the section of a sphere through its centre gives a circle. The arcs on the circumference subtending equal angles will at once be seen to be equal. Hence, if an arc of one degree can be calculated, the circumference is obtained by simple multiplication. (Give the results.)

To make the size of the earth clearer to the child's mind construct simple problems, such as, "If a train travelling one mile per minute could journey around the earth, how long would the journey occupy?"

III. The Motions of the Earth—Introduce the subject by bringing out the fact that we may easily be mistaken regarding motion. Some of the class have, doubtless, been in a train, and on looking out of the window have been convinced that the "other train" or the earth was visibly moving, while they were at rest, but at last realized that it was their own train which was in motion. What child has not noticed that the moon sometimes seems to be hurrying through the fleecy clouds? May we not, then, be mistaken also about the globe on which we live, which seems so fixed and immovable?

First, then, convince the class that *something*

must move. Ask the class where they look for the sun in the morning and where in the evening. Can they explain the apparent change of position in any other way than by saying that the sun moves? To reach an answer, perform an experiment.

Take John and James to represent the sun and the earth, respectively. Let James (Earth) remain fixed while John (Sun) moves in a circle about him, coming into sight on James' left (sunrise), continue till directly in front (noon), then on till he disappears from James' view on the right (sunset).

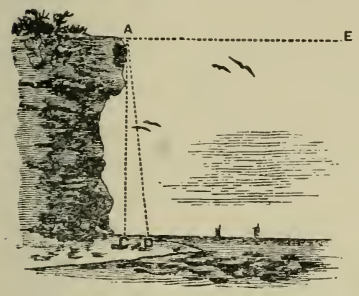
Next repeat the experiment with John (sun) fixed and James slowly revolving on his heel from right to left. The same succession of sunrise, noon, sunset will follow. Repeat with two globes.

Which of these two ways of producing these results is the more likely in the case of the earth and the sun? Either the sun, moon and stars move through millions of miles about the earth every day or the earth revolves on its axis. The distance of some of the stars is so inconceivably great that the former is impossible.

Bring out the fact, that since the sun seems to move from east to west, the earth must revolve in the opposite direction.

2. Arrange the globe so that it can be rotated rapidly, or better, have a small grindstone. When the rotation increases sufficiently drops of water are thrown from the surface *in the direction in which the body is rotating.* Tell the class that the earth does a precisely similar thing. A stone dropped down a deep mine or a cliff always falls a little *east* of a vertical line, in other words, is thrown east by the earth's rotation.

If the earth moved as fast, comparatively, as the grindstone, the motion of the stone would be horizontal from the top of the cliff (AE). If the earth did not revolve at all the stone would fall vertically (AC). As the rate of revolution is slow it falls between these two and nearer the perpendicular (AD).



PROOF OF EARTH'S ROTATION.

Focault's experiment has made the rotatory motion of the earth visible. For a description of this see Jackson's Astronomical Geography (Ginn & Co.), or Lockyer's Elementary Astronomy.

Some of the more Evident Results of the Earth's Revolution—

1. Day and night. Have a lighted candle or lamp and let the pupils observe on how large a part of the globe the light from either will shine. So in the case of our world—one-half will be enlightened. Follow a point during a complete revolution and observe how long it is in darkness. The darkness is simply the shadow of the earth.

2. Use the globe to lead the class to see that in a sphere *at rest* no points on its surface are distinguishable from other points. Next mark with chalk several "points" on the surface of the globe and revolve it. What is the nature of the path in which each point moves? Let the class note the varying sizes of the circles described by the various

points. Where are the points that travel fastest? (Equator). Slowest? There are two which are really at rest, (Poles). The line joining them (Axis). The definitions would readily follow from this treatment, *e.g.*, "In a revolving sphere there are two points on the surface which are at rest. These are the *Poles.*"

"The line joining these is called the *axis,*" etc. Just here a little more light can be thrown on the bulging out of the earth at the equator. Let some boy take a pailful of water and whirl it in a vertical circle. The class will see that some force acts on the water when the pail is at its highest point to prevent it falling out (centrifugal). Since the earth at the equator revolves more rapidly it is acted upon most strongly by this same force and so bulged out while a corresponding flattening occurs at the poles.

The Yearly Motion of the Earth—Place some object in the centre of the table to represent the sun, and let the globe, representing the earth, revolve with its axis perpendicular to the table, but with no motion about the sun.

The class can be led to see that in that case the length of day and night, as well as of the seasons, would be constant at the same point throughout the year.

Next cause the globe to revolve on its axis but with the axis inclined away from the perpendicular, yet with no motion about the sun. The pupils will observe that under such conditions part of the globe would be in continual darkness and part in perpetual sunshine, contrary to the facts observed in the case of the earth. Can any motion be suggested that would agree with the known facts? Choose some point in

the room corresponding to the North Star. Cause the globe to revolve on its axis, with the North Pole pointing towards the fixed point, and at the same time let the globe move about the representation of the sun.

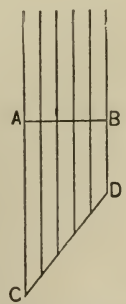
If the globe is made of tin and a lamp used to represent the sun, this part of the subject can be made much clearer, as the contrast between the part illuminated and that in the shadow is much more decided.

Teach the seasons wholly by questioning as the globe revolves on its axis, and moves very slowly about the "sun."

Pictures of the earth, (I) at the vernal equinox, (II) at the summer solstice, (III) at the autumnal equinox, and (IV) at the winter solstice, which can be seen in any geography, will assist in teaching the seasons.

From experience the pupils know that in winter the days are shortest, and hence the sun's rays act for a comparatively short time each day.

The following diagram shows also the weakening of the effects of the sun's rays by their distribution over a greater surface. Rays falling vertically, as at A B, are distributed over twice as great an area when falling obliquely, as at C D.



OBLIQUE RAYS.

Let several members of the class in succession describe the distribution of light and heat on the earth's surface in the different positions during its journey round the sun, *e.g.*, "Just now the part about the North pole is in darkness

day after day, (revolution after revolution), the part about the south pole is in sunshine, while the sun's rays are shining vertically about here." This describes the state of affairs about Christmas, and will serve to make clear to them the kind of Christmas weather experienced, say in Australia.

They may be told that by observation it has been determined that the greatest distance the sun's rays ever fall short of, or beyond the poles is 23° 28′ and this is therefore the measure of the inclination of the earth's axis to the perpendicular. This it is also which fixes the position of the Arctic and the Antarctic circles, which are the circles bounding those parts of the earth which are alternately in darkness and in light for a considerable period.

Let some member of the class take a piece of chalk and hold it steadily at some point on the line between the illuminated part and the part in the shadow, and then revolve the globe. If the globe is in the position of the earth on Dec. 22nd, the chalk will trace the line representing the Arctic circle. So for the Antarctic circle,

Introduce the last pair of parallels by a talk on shadows. At what time of day are shadows longest? Is there any shadow with us at mid-day? Is the mid-day shadow longer or shorter in summer than in winter? It is most interesting to drive a pole into the earth firmly, to require the pupils to mark the position of the end of the shadow at different hours of the day and then to join these points by a curve. They will observe by keeping this up weekly for two or three months that the shadows at mid-day lengthen

in winter and shorten in summer. Under what condition would there be no shadow at mid-day? Is it ever so with us? Where can this occur? Try the globe again in its course round the lamp. Pupils can (roughly) point out how far north the sun's rays are vertical, and may then be told the exact distance (in degrees). This fixes the position of the tropics, and incidentally gives the meaning of the solstices. The class is now ready to be taught the meaning and extent of zones, with their names and characteristics. The position of poles, axis, equator, tropics, and Arctic and Antarctic circles were, as has been seen, determined by (1) The revolution of the earth, and (2) The inclination of the axis to the plane of the orbit. In measuring distances north or south of the equator, it can be made clear that all circles through the poles at right angles to the equator are of equal length and therefore the choice of one has been determined by mutual consent of the nations. Give its position and drill on globe and map on the determination of longtitude east and west, latitude north and south.

Well constructed diagrams are almost indispensable. Let pupils represent all the above positions of the earth at the various seasons of the year.

Let a member of the class show the points on the globe where it is noon at the time while the globe is held in proper position. This collection of points forms a meridian. How long before these points have noon again? It has been agreed to place lines of this kind on the globe so that their noon-time shall be one hour apart. How many will there be? What about the comparative lengths of

these meridians? Then how will degrees of longitude compare in different parts of the earth's surface? How many degrees between two adjacent meridians?

By cutting apples or other bodies of similar form teach the distinction between great circles (those with the centre of the object as their centres) and small circles, (which have not that point as centre). What small circles have been drawn on the globe? (Parallels of Latitude). If these circles vary in size, and yet are divided into 360 equal parts, compare the lengths of a degree on different parallels.

What is the greatest number of degrees north or south you can go (Latitude)? East or west, (Longitude)?

Perhaps the most difficult point in elementary mathematical geography is the teaching of the ecliptic. The following diagram shows one very effective method.

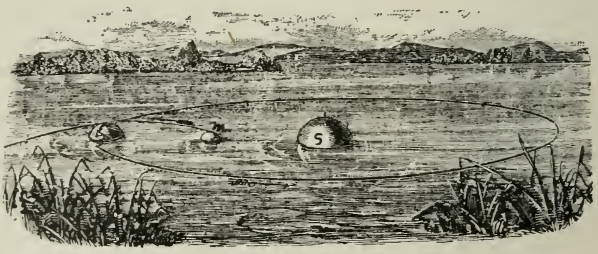


ILLUSTRATION OF THE PLANE OF THE ECLIPTIC.

The surface of the water represents the plane of the earth's motion. The ellipse in which the earth's yearly motion is completed is the ecliptic. The

diagram also makes clear that the moon's path does not lie in the same plane, and that all eclipses must occur while the moon is passing through the plane of the earth's orbit. The objects may easily be placed so as to make clear the conditions that produce an eclipse of the sun and an eclipse of the moon.

CHAPTER VII.

HISTORY.

Before undertaking to do any school work, it is of prime importance that the teacher should clearly settle in his own mind the answers to three questions :—

(1) What is to be taught? (2) Why this should be taught? (3) How it is to be done?

It is the purpose of this chapter to attempt answers to each of these questions so far as the subject of history is concerned.

I. Why should History be Taught? 1. *Uses.*— History reveals the past life of a people and so imparts facts which are of use everywhere.

(a) They are of use in enabling one to understand literature. The newspapers, magazines, and general literature are written for the man of general intelligence. To be ignorant of the great facts of history is to confess that one is lacking in general intelligence, and is thus cut off from understanding much that is written and talked about.

(b) As history teaches the deeds and habits of men and the results of their actions, it supplies valuable lessons of conduct. It is hence, as Carlyle says, "Philosophy teaching by example." In this way history may be said to be the window of the soul, looking out upon the deeds of humanity. Thus it makes one experienced and old without the

troublesome lessons in the one case and the grey hairs and wrinkles in the other.

2. *Disciplinary Values.*—History has great value as a subject for training the mind.

(a) It exercises the memory. This is true of all history teaching, even when taught improperly as it often is, but when a correct use of the laws of association is made, it is unrivalled for giving legitimate exercise to the memory.

(b) History constantly calls into exercise the powers of imagination. Unless the scenes of the past are made to stand out clearly in the mind of the learner, much so-called history teaching must be a mere saying of words—a parrot exercise. It is in this connection that vivid descriptions, apt illustrations and constant appeals to things within the experience of the child are so valuable.

(c) As all facts are more or less complex, and so need to be analyzed to be fully understood, history is one of the best school subjects for *indirectly* teaching the importance of getting a clear view of the causes of events and their effects by analyzing these, noting how each operated in its own proper direction, with its own degree of strength, and how all concurred to produce the general result. It is no easy matter to measure the forces that influence human conduct, and determine the course of events, but in the attempt to do this the student soon finds ample practice in analyzing events, thus history disciplines the mind in analysis.

(d) History presents evidence to be weighed; events and characters must be constantly compared, contrasted or balanced, hence the judgment or

critical side of the mind receive ample exercise in the study of this subject.

(e) Judgment may even pass into reasoning when premises are laid down, inferences are drawn and causes are searched out. In one sense history may be regarded as the solution of a series of problems, types of which may be conveniently stated as follows:—(1) Given certain moral, religious, social, physical, or other forces, what effects may be expected to result? (2) Given some condition of human society or some event, how is it to be accounted for?

(f) By appealing to our sympathies and by gratifying our curiosity, history attracts us. Naturally we are curious to know what manner of men our ancestors were, whence they came, how they lived, what they believed, how they were governed, so when taught properly, history is so fascinating to a young mind that it arouses interest, awakens curiosity, induces attention, and so helps to form habits of *concentration* and *attention*.

3. *Value for Moral Culture.*—The subject of history is the doings of human beings. When these are treated as such and not as mere names, its lessons induce moral behavior. The men who make history become models whom the learners unconsciously imitate. How many British boys have been inspired by the example of a James Watt or a George Stephenson, or American boys by that of a George Washington or a Benjamin Franklin?

Its lessons induce a spirit of optimism and beget confidence in the ultimate triumph of right and goodness. The learner, little by little, looks more

and more upon the bright side of things and the right side of people. He recognizes the goodness and greatness of other ages and other peoples, hence a healthy spirit of humility is begotten in him, and thus its lessons correct the insular narrowness of a Briton or the spread-eagleism of an American orator.

4. *Value for teaching patriotism.*—As history teaches what others have done and suffered for us, our national pride is constantly stimulated and feelings of patriotic zeal are constantly called forth. History thus becomes one of the best, perhaps the only means, at the disposal of the teacher to inculcate patriotism. Nowhere else can patriotism so well feed her fires as at the altar of history.

5. *Value for language work.*—As history furnishes many apt phrases, *e.g.*, as brave as Leonidas, as just as Aristides, as stern as Cato, as generous as Philip Sydney, and gives ample practice in both oral and written composition, it gives most valuable training in the powers of expression. In the practice of prose narrative and in supplying topics for composition, history stands unrivalled among school subjects.

II. What to Teach—1. *Facts.* So much is said to-day about the uselessness of teaching facts that it is well to remind teachers that there can be no lessons drawn from history without a knowledge of the facts upon which these are based. While facts alone do not make history, there can be no "philosophy of history" without them. It is true that there is history only when the facts are elaborated, combined, and brought into their proper relationships. But for beginners history must necessarily be largely a study

of facts. These should relate both to the domestic and the foreign history. In the former class such facts as relate to the progress of the people in arts, science, commerce, etc., as well as to manners and customs, civil struggles, etc., should be taught. The latter class will necessitate the teaching of foreign wars, treaties, etc.

2. *Teach characteristic facts only.* These are such as mark the age, the epoch or man. Details and connecting links should be filled in at leisure or on a second discussion of the subject. Gathering these details should be the work of the pupil.

Those who have only a limited knowledge of history and so cannot discern the relative importance of various events (historical perspective), violate this suggestion in one or other of two ways:

(a) They teach facts which are not characteristic, and so create a false impression, or

(b) They teach characteristic facts but so combine them as to teach them in disproportion.

3. *Teach biography.* A nation is a collection of units. The more prominent of these should be taught. The great value of such biographies is their attractiveness. Children take much more interest in actual men and women than in the facts of sociology. Another advantage of biographical teaching is its unity, as well as its convenience as a nucleus for incidental teaching on a number of other points. Examples of such teaching may be found in the biographies of Columbus, Jacques Cartier, Champlain, La Salle, Frontenac, Wolfe, Montcalm, Wm. L. Mackenzie, George Brown, J. A. MacDonald, Egerton Ryerson, and others in Canadian history; and in

Alfred, Becket, Langton, Simon de Montfort, Chaucer, Warwick, Francis Drake, Shakespeare, Cromwell, Marlborough, the Pitts, Watt, Stephenson, and others in English history.

4. *Teach dates.* Some knowledge of dates is absolutely essential to an intelligent comprehension of history. Chronology is called the handmaid of history. However, all dates are not to be learned. Those only which mark eras or epochs should be taught at first. When the event is taught, explained and illustrated, the date will be so associated with it that its remembrance is easy. The date should be learned through the event, and never the event through the date.

5. *Teach civics.* As the children should be made acquainted with the society of which they will soon be members, with the civil duties which they will have to fulfil, with the institutions they will have to support and strengthen, they must receive instruction in civics, which may be defined as the science that treats of citizenship and of the relations between citizens and the government.

Although this is comparatively new in our schools, the idea is not new. At the beginning of the century Talleyrand demanded, "A new catechism which should make known the nature and requirements of the constitution, since men were to live under its laws and defend it at the peril of their lives." In French, Swedish and Swiss schools there is a well defined programme of this work. For our Ontario schools a course in civics should deal with such subjects as the following:—

(1) Government:
  (a) Different forms of—Monarchical, Aristocratic, Democratic, etc.
  (b) Branches of the Government—Legislative, Executive, Judicial.
(2) Legislative branch:
  (a) Governor-General and Lieutenant-Governor, their duties, appointment, etc.
  (b) Senate, its composition, duties, powers, etc.
  (c) House of Commons and Legislative Assembly, their composition, duties, powers, etc.
(3) Executive branch:
  The members, how appointed, their duties, etc.
(4) Judicial branch:
  The need of law; how good citizens honor the law; judges, courts, etc.
(5) The Municipal System of Ontario.
(6) The citizen—his obligations, his rights, etc.

III. How to Teach History—1. *Teach through interest.*—As one of the main purposes of teaching this subject is to induce an active interest in the everyday affairs of life and hence to make intelligent readers, this subject is to be so taught as to excite the liveliest interest of the pupil. This can be done by the teacher who has a wide knowledge of the subject and is himself really interested in his work. History is not a subject that can be taught by everyone who calls himself a teacher. To teach it successfully requires even greater preparation than suffices to teach other subjects with fair efficiency. In making this preparation, the necessary reading should not be confined to the so-called histories.

Poets, and especially the writers of the historical novel, often furnish very vivid pictures and very correct accounts of the life-history of a people. The teacher should make an extensive use of these and the ballad, not only in his own preparation but also in his recommendation of what books the pupils should read.

2. *Teach orally at first.*—The voice of the teacher is necessary to arouse the pupil to effort, to excite his sympathy and to create an interest in the work, so the lessons at first should be oral. Thus also the teacher is enabled to adapt his matter to the needs of the class, and can pass over the unimportant while dwelling on the important. But soon the text-book should supplement the oral work for there is danger in merely entertaining the pupil while making the work interesting and animated. To prevent incomplete, unsystematic teaching, books should be used from the fourth form onward.

At the same time the evils attending oral work may be minimized by close questioning during the lesson, and at its close pupils should be required to stand and give as complete an account as possible of each part of the lesson. This is preferable to having many short trite questions answered. Pupils should also be required to write out the lesson, either in answer to questions asked on it or as a composition. This should be done before the lesson has time to become so dimmed as to be largely forgotten. With carefully framed questions, it will often be an advantage to allow the pupil to use his text book, or notes.

3. *Teach history and not a text book.*—To do this

the teacher must know his history. His knowledge must be far wider than is to be got from the study of an ordinary school history. The teacher who possesses this knowledge will not be likely to reproduce the text book and nothing more. He will be in a position to give a simple narrative of deeds and events, and a glowing description of persons and their doings. His history teaching will never be a mere recital of names and dates.

4. *Teach through the medium of biography when possible.*—Biography is one of the most interesting and ennobling of studies for children. Fires of enthusiasm are lighted in their minds by the lives of great men, and unconsciously they are influenced by the lessons of such lives.

5. *Teach so as to connect the new with the old.*—Care should be taken to connect the new with circumstances and conditions that are now known and familiar to the pupils. In doing this the narrative should be so objective that events are not only spoken about but become experiences to them by the natural processes of thought. Many teachers still are content to have their pupils repeat, parrot-like, such expressions as "Alfred came to the throne in A.D. 871," when the children know nothing of a throne, or coming to a throne, or of A.D. 871. Such work must result in a permanent dislike for this subject and must inevitably defeat the purpose for which this subject is being taught.

6. *Teach by making use of the self-activity of the pupil.*—The pupil must be more than merely receptive. He must be active in reproducing both orally and in writing what he has learned as well as

the thought produced by it. Hence the importance of having the child make diagrams, charts, etc., illustrating the lesson and of having him use his judgment and reasoning powers in reaching conclusions.

7. *Teach by comparison and contrast.*—When possible, the pupil should compare similar and contrast dissimilar actions and persons. Doing this regularly causes him to find much more in history than a mere remembering of facts. This compels him to use his judgment as well as indirectly teaches him to associate any effect with its proper cause.

8. *Teach through proper associations.*—Connect history, geography and chronology everywhere, show how the history of a country is affected by its geography. Show how its geography influences the national character of the people. When speaking of St. Petersburg refer to Peter the Great and his work in making modern Russia; when Arabia comes up in geography refer to Mahomet, the Hegeira, etc.

9. *Teach by bringing the study of history into organic connection with the study of language.*—No subject is better adapted to advance the real study of language than history. The connection between language and history can readily be made as follows:—

(a) Use the historical topics as subjects of composition.

(b) Read for the class frequently well written descriptions, not mere manuals.

(c) Have recitations of patriotic poems and ballads such as:—This Canada of Ours (G. W. Johnson); God Bless Canada (Dewart); A Ballad for

Brave Women (Mair); The Plains of Abraham, (Sangster); The Charge of the Light Brigade, (Tennyson); Wreck of the White Ship (Hemans); Edinburgh after Flodden (Aytoun); The Armada, (Macaulay), etc.

10. *Teach by taking advantage of some occurrence of general interest to the pupils or neighborhood.*—A holiday or an election should be used to make clear the object of the holiday, the necessity of elections, how they are held, etc. On the last school day before May 24th, may be discussed such questions as the extent of the British Empire, its development and resources, the relations of Canada to it, the unity of the empire, the flag and its significance, etc. On a similar occasion before Dominion day, a lesson should be given to the school on the extent of Canada, its resources, its commercial advantages, its government, the advantages of being a Canadian, etc.

An election in the neighborhood is a fine opportunity of teaching children the meaning of the ballot, how to mark a ballot, etc. A good plan is to hold an election in school with the pupils as the voters. One of the pupils is appointed returning officer, another a deputy returning officer, another poll clerk, others scrutineers, etc.

The visit of the assessor or tax collector, a case before a magistrate, the annual repairing of the roads, etc., may be used to make clear the nature of our municipal and provincial government. The work should be very largely conducted by questions These may be given one day and the answers taken the next. In case there is trouble in answering a

question, a committee may be appointed to ascertain the answer and report. With a question or two propounded regularly, and a few minutes—not more than ten—taken to discuss the answers each day, great interest may be aroused as well as intelligent observation and inquiry set on foot. Such questions as the following will soon make the pupils intelligent and interested regarding some of the common things about them:—Who is the assessor? What does he do? Who appoints him? For how long is he appointed? For how much is your father's property assessed? What is the paper called on which the names of the people and the values of their property are placed? Can one object to his assessment? How can he do this? If a mistake has been made how is it rectified? What is "real" property? What is "personal" property? etc.

IV. Stages in Teaching History—From the state of development of the pupil the teaching of history falls naturally into three stages.

1. *First stage—the picture and story stage.* This is adapted to the youngest pupils in our schools. There is to be no formal teaching of history but now the way should be prepared for later instruction of a systematic kind. Lessons dealing with the men of the past—how they lived, dressed and travelled—narratives of personal adventure—deeds of heroism—stories beginning with "once upon a time," etc. The learning of facts is of very secondary importance, hence no attempt should be made to have abstracts of the teaching remembered.

2. *Second stage—the information stage.* This is the stage when the pupil has to acquire a clear and

well-ordered outline of the most important facts. These should be grouped under leading events rather than chronologically, *e.g.*, in Canadian history, the discovery and exploration of Canada, the government of New France, the struggles between the French and British colonies for supremacy, etc. Minor points which have little bearing upon the general story should be omitted. The treatment of what is given should be full and realistic, and the teaching must be definite and coherent—vividness alone will not do. The facts must be so associated that they may be recalled with readiness and certainty.

3. *Third stage—the period or epoch stage.*—As the general sequence of the more important facts is now known, the teacher may begin with any period as *e.g.*, the Dominion of Canada since Confederation, the age of Victoria, the Stuart period, etc. What has been previously learned will form the basis of the new work. The facts should be cemented into a clear and consistent whole, so that any subsequent acquisitions may be related to the whole, and thus find their own natural place in the period. It is in this stage especially that the pupil will be required to exercise his judgment and reason upon the facts as they are presented to his mind.

V. Methods of Teaching History—1. *Chronological Method.*—This discusses the events as they follow in time, whether they are connected or not.

2. *Topical Method.*—The leading events in the life and development of a nation during the period to be studied are selected, and the history of each is pursued consecutively, without reference to other events, except in so far as these have a direct influence

upon the one under consideration. The period is thus studied under such headings as wars, the growth of constitutional liberty, the progress of the people in arts, the power of the church, etc. This is the method recommended for the third stage.

3. *The Analytical Method.*—This method takes a fact as it is and step by step proceeds backwards until a beginning is reached. It begins with the effect and searches out the cause. It proceeds from the consequent to the antecedent.

4. *The Synthetical Method.*—This method is just the reverse of the Analytical. It begins with the cause and works towards the effect. It proceeds from the antecedent to the consequent. It is chronological in its nature.

From the foregoing it is seen that a topical method must be analytical, so far as the whole period or epoch is concerned. Whereas, the treatment of any given topic may be either analytical or synthetical.

VI. Difficulties in Teaching History—1. *Difficulty from the nature of the subject.*—The subject demands from the teacher wide reading. He must be, as Bacon says, a "full" man. Much experience and sound judgment are also necessary to make a proper selection of facts.

2. *Difficulty from maintaining proper historical perspective.*—The leading events and the great actors in these should be at the front. The unimportant, both in events and actors, should be kept in the background—this is often difficult to do, especially for the person of narrow reading.

3. *Difficulty from the teacher.*—The teacher must

possess good descriptive powers. He must be apt at illustration, skilful in comparison, be possessed of a good voice. These will enable him to vitalize his events and characters.

4. *Difficulty from the lack of experience in the pupil.*—For the pupils, history is a strange mixture of the simple and the complex, of the easy and the difficult. They easily comprehend a part. Other parts require maturer minds than theirs.

5. *Difficulty from the abuse of the memory.*—There is a strong tendency to overwork the memory. Very often this mental power is called upon to play the part of the pack-horse in carrying things which have neither been understood nor digested.

VII. Mistakes in Teaching History—1. *Mistake in using the text book.*—It is a mistake to assign the lesson in the book before giving an outline of it in the class.

2. *Mistake from having no settled scheme.*—The teacher has no clear idea what should be attempted, how much detail should be given, where he should finish, etc.

3. *Mistake from unsuitable matter.*—It is a mistake to attempt to teach matters which are entirely beyond the range of experience of the child. When such is done, allusions are made which are not understood, terms are given which have no meaning, etc., hence the pupil is confused and soon acquires a dislike for the entire subject.

4. *Mistake from neglect of historical perspective.*—It is a mistake to teach as if all events are of equal importance.

5. *Mistake from insufficient preparation.*—It is

a mistake not to prepare each lesson thoroughly. Even if the teacher is an extensive reader and a careful thinker, he requires this careful preparation to prevent obscurity and staleness.

6. *Mistake from not using proper appliances.*—It is a mistake not to use the blackboard, maps, charts and pictures to illustrate the lesson, and thus appeal to the eye as well as to the ear.

7. *Mistake from using the memory improperly.*—It is a mistake to permit unintelligible cram, or to teach as though general impressions alone were needed. Without a clear apprehension of facts history is practically valueless.

8. *Mistake from introducing critical doubts.*—It is a mistake to tell a story and then proceed to show that probably this or that part is false. Such criticism is unsuited to young children.

9. *Mistake from insufficient questioning or improper review.*—It is a mistake not to question thoroughly at the time of the lesson. This compels the pupil to give that mental concentration to the work which is apt to be wanting when he knows that he is not to be thus questioned. Reviews should be so frequent that the second impressions must occur before the first have vanished, to produce any effect. Questions and reviews are the two main means of insuring clear and definite concepts.

VIII. Suggestions—1. *Enthusiasm and a love of history are necessary.*—As the end of teaching history in school is chiefly to induce a love of the subject and thereby promote subsequent reading on the part of the pupil, to teach successfully the teacher must be enthusiastic over it. As in all other school

subjects, this is a case of "like teacher like pupil." This earnestness and enthusiasm can be acquired by careful study, extensive reading and much reflection and discussion.

2. *Maps, sketches, charts, pictures, etc.*—Sketch routes of travel and journeys of exploration. Draw plans of places, and the position of contending armies using crayons of different colors. Show pictures illustrating the dress, ornaments and habitations of the people; their pursuits, manufactures and commerce; the architecture of the times, etc.

3. *Historical perspective should be preserved.*—In connection with any period, epoch, or reign, there is always some event round which the others circulate, towards which they gravitate, and from which they radiate. This should be selected and carefully taught.

4. *Use the comparative method.*—From the time the subject of history is seriously taken up, (second stage) the tracing of analogies is not only useful in itself, but is especially valuable in teaching this subject. One series of events is often the best aid to understanding another. The comparison of the two is one of the best means to make clear both. In this way a period known, aids in the study of a new one; the present helps in understanding the past. Only thus can the past be made interesting and real to the child.

5. *Procedure in an ordinary lesson.*—The usual method should be that of an oral lesson. The teacher must tell the story as if he had been an eye-witness with sufficient fullness for the pupil to get clear and accurate notions, and with such

emphasis and reiteration as are necessary to its being retained. The lesson must be a living reality. There must be no vagueness, no wandering aimlessly hither and thither. At convenient points, the narration should stop and the pupils be required to recapitulate what has been gone over and a concise, well ordered summary of what is essential should be placed upon the blackboard. During the recital use should be made of the maps, sketches, charts, and pictures already referred to.

6. *The use of the text book.*—The chief use of the text book is to give definiteness to the impressions made during the oral lesson, as well as to enable the work to be reviewed as often as necessary. With pupils having text books the lesson may be conveniently brought at least three times before their minds as follows :—

(a) When the lesson is first outlined orally by the teacher.

(b) When the pupils, on a subsequent day, are questioned closely and carefully upon the previous lesson.

(c) When the lesson is reviewed as a prelude to the class being questioned upon the last lesson given.

In a rural school this review may be conducted by the class answering in writing questions which the teacher takes a moment to give before he begins to teach another class. The first part of the history lesson would thus be the reading by the pupils of their written answers to these questions.

7. *Use supplementary readings.*—As one of the main purposes of teaching history is to induce children to read, and as this is largely a matter of

liking and habit, the teacher should frequently read vivid descriptions of men and things. (Notes should be kept of where such may be found). This will tend to excite the desire for further reading. Ballads and poems illustrating parts of the history under discussion should be not only read but also learned.

The historical novel such as Conan Doyle's "Micah Clarke" or "The White Company," Scott's "Ivanhoe" or "The Talisman," Kingsley's "Westward Ho" or "Hereward," Henty's books, etc., may be recommended to be read by the pupil himself. Supplementary Readers, such as those prepared by Chambers or Collins or Blackie, may be purchased by the trustees for use in the school. Such means will do much to impart a liking for the reading of history.

IX. Lesson Plans—As a guide to beginners in drawing up a lesson plan, one is here submitted. The necessary headings are purposely omitted and only the body of the plan is presented. Each teacher should fix in his mind as clearly as possible what he means to teach and how he intends to do it. When an outline of each of these is systematically arranged the result is a lesson plan. When possible, and in history it is always possible, the plan should be divided into two parts called "Matter" and "Method." The matter should show clearly what is to be taught under each heading and *not the headings alone*. These headings can never show what the teacher intends to impart. This should be stated clearly, not only in history plans but in those for all subjects.

Magna Charta

Matter.	Method.
I. *Introduction.* Previous efforts of the Barons to secure themselves against oppression. Charter of Henry I.	Question on the terms of this Charter.
II. *Circumstances which led to the Charter.*	
1. The abuses of the Feudal System.	1. Explain and illustrate.
2. The exactions of the reign of Richard I.	2. Question pupils as to the causes of these.
3. Oppression of John. His character. The loss of Normandy. His submission to the Pope.	3. Explain and illustrate each of these.
III. *Means by which the Charter was obtained.*	
1. Council of Barons held at St. Alban's during John's absence. His return and revenge.	1. Explain and notice the union of spiritual and temporal lords.
2. Confederacy of Barons formed at St. Paul's, 1213. Charter of Henry I. read.	2. Explain the significance of this.
3. John renews his cruelty and oppression. Confederates meet at St. Edmundsbury, 1214. John attempts to detach the clergy from the confederacy. Failure.	3. Explain and illustrate each.
4. John compelled to sign the great charter at Runnimede, 1215.	4. Point out on map.

Magna Charta—Continued

Matter.	Method.
IV. *Provisions of the Charter.*	
1. Abuses of Feudal System were redressed.	1. Explain and show how.
2. Royal prerogatives were restrained.	2. " "
3. A fair administration of the Law was secured.	3. " "
4. The liberty and property of the subject were protected.	4. " "
V. *Effects of Magna Charta upon the Nation.*	
1. Resistance to despotic rule was encouraged.	1. Question and explain.
2. The love of liberty was strengthened.	2. Refer to the fact that the Charter was ratified thirty-seven times down to the second year of Henry VI.

CHAPTER VIII.

ARITHMETIC.

The chapter on this subject, as originally prepared, contained a full discussion of the value and uses of arithmetic, the origin of number, the stages of the measuring process, the unity of the subject, the elements—quantity-unit-and-number—entering into a complete idea of number, the nature and relation of the operations, and the development of the activity involved in giving numerical valuation to quantity. Limitation of space, however, compelled the writer to omit the theoretical part.

It is intended, in a short time, to place before the profession the complete work in which Theory and Operations will be logically and psychologically treated.

Primary Number.—Number arises through the proper adjustment of the mind's activity in dealing with quantity. How sense material becomes quantified, how quantity becomes valuated, how objects when presented arouse forces and determine the directions of the fundamental activity, what forces tend to obstruct and counteract this activity, and how the mind rises from the perception of related things to a conception of the relation, are all important questions for the teacher.

Discrimination and relation are involved in all number from the fixing of an indefinite vague

quantity to the most complex valuation of the same.

Counting is the fundamental operation in arithmetic. The other operations are devices for speed by using memorized results instead of going over the same modes of measurement each time.

The higher steps are dependent on the elementary process, but what is implied in the counting stages is made explicit in multiplication and division, and definitely notated in fractions.

Number then should be treated as resulting from measurement, the process by which the mind makes the vague whole definite.

A proper method recognizing the nature of number will harmonize subject and mental action.

There are four methods of teaching primary arithmetic, (1) Symbol Method, (2) Objective Grube Method, (3) Constructive Method, (4) Relative Magnitude Method.

In the original these were fully discussed and compared in the light of the psychology of number.

The Constructive Method is the one advised in this book. It is rational; material is presented; the pupils make the indefinite quantity definite by discriminating, relating and numbering the parts chosen as measures.

When the material is psychically worked upon the necessary prerequisites of time and space accompany the normal activity, and number ideas become focal in consciousness.

"This method expands the mind demanding the repetition of activities and taking advantage of dawning interest in every kind of value; it relies

upon the formation of habits of action or definite mental powers, and secures memory of facts as a product of spontaneous activity. This method, relying on the mind's own activity of parting and wholing—its natural functions—secures a continual support and reinforcement from an internal interest which is at once the condition and the product of the mind's vigorous action."—"*Psychology of Number, McLellan and Dewey.*"

To Teach the Numbers from 1 to 10—Use kindergarten sticks or cubes, and test the pupil's knowledge of his one, two, etc.

Working from within a whole, let the pupil separate groups into parts and combine them, and see that he recognizes a whole as made up of parts, and that the parts make a whole. By exercises in counting give an idea of an indefinite whole through the relating of the parts.

Pupils may count single things without knowing the number involved in the names, but this is a strong starting point.

Give ideas of more or less and compare groups to show that the more or less depends upon the "how many."

Give constructive exercises requiring a certain "how many" to enable pupils to fix the indefinite whole by looking to the parts.

Begin with two. Pupil knows 2 as 2 "ones." He will require to develop the number 2 as 2 "one objects," 2 "one groups," etc., and by this means develop the idea that 2, 3, etc., are twice, thrice, etc., a certain "thing-unit" used to measure the whole.

Proceed in this way with the numbers from 1 to

10, and teach the same by steps similar to those outlined in teaching "eight." Make haste slowly.

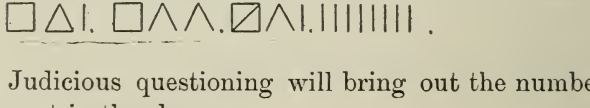
To Teach Eight—First supply pupils with 16 kindergarten sticks, 8 white, and 8 red.

Let them find a "two" (the qualitative difference, color, will suggest a division).

Let them place the red group to one side.

Pupils, in dealing with the parts—say of eight—to gain an idea of eight, lose sight of the whole when the attention is on the parts. A pupil will take the group eight (unknown eight to the pupil) and divide it into two parts. He will tell you there are two fours, but he will forget from where the two fours came. Let him, therefore, keep the red group before him, so that the analysed facts in the working group can be referred to the red, or standard group without an act of synthesis with the working group.

The pupil will construct to bring out the following facts which should be recorded on the blackboard.



Judicious questioning will bring out the number element in the above.

Now represent these facts in the form of number pictures, as

etc.

Show that the dots stand for any unit.

Question on the number picture. How many fours? How many twos? Cover a part; how many are covered? Draw a line through the dots. How many above the line? How many below?

Now give the name "eight" to the group, and write the symbol on the blackboard. Then indicate the facts discovered in 8, as 4 and 4 = 8, etc

Leave out parts, as 8 is 4 and what? 5 and what make 8?

Give exercises in counting out groups of eight. Then we can have one 8, two 8's, etc.

Let pupils measure distance with an inch measure, and put a chalk mark at the beginning and end of each eight. Vary the units.

Secure practice from related experience.

Bring out that 4 and 4 make 8, and that 4 is used as a unit twice to measure 8. Let pupils see that if we count up 8 in twos, that 2 is the unit, and that 4 shows how many counts of 2 we make.

Give the idea, name and symbol. Make use of the idea to master it and by practical problems bring about familiarity through use.

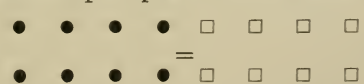
Give practice with numbers thus:—

What number with seven makes 8? with one makes 8? with six makes 8? with two makes 8? etc.

How many fours in 8? twos? ones?

Give seat work.

After the numbers from one to ten are taught, or as each is developed, place on cardboard as follows:—



Supplement with easy problems, and let pupils work up problems from their own experience.

Notation and Numeration—If the numbers from one to ten have been taught as above, the pupil will have little difficulty with notation. Write ten

as 1 ten and 0; two tens, as 2 tens and 0. Write thus:—1 ten, 2 tens, 3 tens, 4 tens, 5 tens, 6 tens, 7 tens, 8 tens, 9 tens, 10 tens. Again as:—10, 20, 30, 40, 50, 60, 70, 80, 90, 100.

Read above as 1 ten, 2 tens, etc.

Now 1 ten and 1 unit, 11; 2 tens and 2 units, 22, etc.

0,	10,	20,	30,	40,	50,	60,	70,	80,	90
1,	11,	21,	31,	41,	51,	61,	71,	81,	91
2,	12,	22,	32,	42,	52,	62,	72,	82,	92
3,	13,	23,	33,	43,	53,	63,	73,	83,	93
4,	14,	24,	34,	44,	54,	64,	74,	84,	94
5,	15,	25,	35,	45,	55,	65,	75,	85,	95
6,	16,	26,	36,	46,	56,	66,	76,	86,	96
7,	17,	27,	37,	47,	57,	67,	77,	87,	97
8,	18,	28,	38,	48,	58,	68,	78,	88,	98
9,	19,	29,	39,	49,	59,	69,	79,	89,	99

All the numbers from 1 to 99 may be put into the form of a table as shown in the square.

The names may now be given. Some, as eleven and twelve may be given earlier.

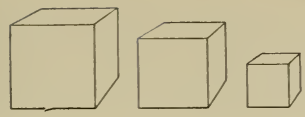
Give pupils practice in building the numbers with sticks. Eleven and twelve are named.

Contrast and explain the others in this way—three (3), thirteen (13), and thirty (30); four (4), fourteen (14), and forty (40).

This will give significance to the names and enable pupils to see the law by which numbers are named. The notation, from 100 to 1,000, may be similarly developed.

Give practice in decomposition. Show that 105 also indicates absent tens, and that 120 indicates absent units.

Use devices for fixing the place of the tens, units and hundreds, as:—

Boxes  or figures 22_2

When the pupil has grasped the principle of place value in small numbers, he will have no difficulty in understanding it when extended.

By this method of teaching notation, numeration is learned at the same time.

Drill pupils on reading, writing and evolving numbers in the above tables until they are entirely familiar with them.

Separate numbers into numerical periods, and let pupils name and remember them.

See that this conventional part of the subject is thoroughly taught and many difficulties in the simple rules will be removed.

Familiarity with 10, our fixed basis of notation, will furnish a key to apparent difficulties. The pupils grasp that numbers greater than ten are expressed in terms of ten and must be so thought of and operated with. They will be led to recognize the law :—Every figure placed one place to the left represents ten times its value in that first place.

If primary number teaching is carried out according to the preceding suggestions, and elementary notation and numeration properly co-ordinated therewith, there will be little difficulty with the language of number. The significance of the digits and the noughts is known. The pupil knows that ten units make a new unit of measure; he will readily extend this to the higher ten unit, etc.

Drill of course must be given in reading and writing numbers in order that the pupil may immediately state the number and its unit, and also notate any named derived quantity.

The significance of the ten digits in representing numbers of any magnitude should be pointed out. Numbers from 1 to 9 are expressed by one digit; from 10 to 99 by two digits, each representing a particular unit. This may be extended to thousands, etc.

The idea of naming groups by the use of previous names should be impressed. The binding together of ten as one ten, the ten tens as a one hundred, etc., by a thread of thought will suggest uniformity. Few characters and place value give rise to the unity of the notation system.

The Four Simple Rules—All calculations are based on the fundamental operations, addition, subtraction, multiplication and division, and the pupil should become thoroughly acquainted with these fundamental processes if he is to master the art of arithmetic, for theory alone will give neither rapidity nor accuracy in calculating.

Number develops the thought power; the operations enable the student to use numbers in defining valued quantities in many convenient ways.

This part of arithmetic develops the power of attention, accuracy in thought and expression, and should receive its proportion of time in the school room. Constant and well directed practice is necessary in order that the pupil can make use of arithmetic outside of the school room.

Our system of notation, the symbols, and signs of

operation, formal statements of the operations and arithmetical processes, all tend to render the subject obscure; and too much attention cannot be devoted to the representative side of the thought expressed in these complex forms.

Do not attempt to teach the four simple rules simultaneously. All the operations are logically implied in counting, but they should not all be forced into conscious recognition at a time when the pupil is mastering the form and expression of simpler notions.

Many of the facts brought out in teaching primary number imply the four simple rules, but there should be no explicit statements of the formal processes.

Addition—When we measure quantity with a unit we get number and call this quantity derived or measured; and the number is the measure of the quantity in terms of the unit. We can measure in succession a number of quantities, derived from the same unit, and find the total number of times this unit is repeated. Since this measuring by hand would be tedious and sometimes impossible, we operate with the numbers which represent the measurements, by memorizing a table of the combinations that are found in the numbers from one to ten. These results can be easily extended to hundreds and thousands.

Addition is the operation of combining the numbers that measure the parts of a quantity in terms of a certain unit in order to find the number that expresses the aggregate measure of the whole measured quantity in terms of the same unit.

The following combinations should be memorized and practice given in addition in order to apply the table. This order will be found advantageous.

(*a*)	1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 8	(*b*)	5 4 3 2 1 5 6 7 8 9	(*c*)	2 3 4 6 7 8 9 2 3 4 6 7 8 9
(*d*)	2 2 2 2 2 2 3 4 5 6 7 9	(*e*)	3 3 3 3 3 4 5 6 8 9	(*f*)	4 4 4 4 5 7 8 9
(*g*)	5 5 5 5 6 7 8 9	(*h*)	6 6 6 7 8 9	(*i*)	7 7 8 8 9 9

These combinations are the foundation of all the operations and they should be thoroughly mastered so that the pupil can give them rapidly and accurately, in any order as $4+7=11, 7+4=11, 11=7+4, 11=4+7$.

In time the emphasis may be placed upon the reverse process and the subtraction table learned thus: $11-4=7, 11-7=4$;

Questions in addition may be set giving practice in the new combinations, and at the same time reviewing those already learned.

Examples.—(a) Practice in tens by using $7+3$. Arrange and add vertically, $3+3+7+4+6+7+3+5+5+7+3+3+7+4+6+5+5+7+3$. (b) Practice in $4+5$, $3385+8992+9556+5228+2939+9255+2323+2963+5759+7637+3896+7236$.

A full complete set of addition questions dealing with the combinations has been necessarily omitted.

If the above results are arranged vertically and added it will be found that no addition is required that has not been learned, although the specific object is practice on $7+3$, and $5+4$.

See that the pupil uses the addition table in practice in addition.

The work should accordingly be graded and systematically developed until the pupil has

thoroughly mastered and applied all the combinations given above, and can add accurately and silently. Addition may be divided into two cases.

i. Addition of numbers in which the sum of any column is less than ten.

ii. Addition of numbers in which the sum of any column may exceed nine units of that order.

Easy exercises should be given in the first case until pupils become familiar with the formal process. Measuring should also be emphasized. Show the necessity for the operation.

Case II.—Example.—Add 347, 965 and 821.

Writing vertically $347 = 300 + 40 + 7$

$965 = 900 + 60 + 5$

$821 = 800 + 20 + 1$

Adding we get $2000 + 120 + 13$

$= 20\text{h} + 12\text{t} + 13\text{u}$

$= 20\text{h} + (1\text{h} + 2\text{t}) + (1\text{t} + 3\text{u})$

$= 21\text{h} + 3\text{t} + 3\text{u}$

$= 2100 + 30 + 3$

$= 2133$

The above will appear simple in class work, and the pupils will soon discover the carrying process, more especially if this part of the work is varied. Then the work may be shortened. Each sum will be analysed when added.

Subtraction—Subtraction is the inverse of addition and the genesis of division, just as addition is the genesis of multiplication.

Subtraction is the operation of finding a number which is the measure of the difference between two derived quantities expressed in the same unit. We work for the number and apply it as a measure of

the difference. Now review and emphasize the sum and parts in addition tables.

There are two cases of subtraction.

i. When the figure of each order in the minuend is greater than the figure in the subtrahend.

ii. When the figure in the minuend with the exception of the first to the left may be less than the figure of the same order in the subtrahend.

Some practical measurements should now be given to lead up to the necessity for subtraction.

Pupils should also be led to see the advantage of operating with the remembered results thus doing away with counting.

Case I.—Example.—From \$458 take \$123.

We are required to find the number that will define the difference when \$123 are taken from \$458.

Writing thus $\begin{smallmatrix}458\\123\end{smallmatrix}$ we have eight units − 3 units = 5 units; 5 tens − 2 tens = 3 tens; 4 hundreds − 1 hundred = 3 hundreds. The difference is \$335.

Considerable practice should be given in examples of this kind until the pupil becomes familiar with the nature of subtraction.

Case II.—Either of two methods may be used. The process may or may not be explained, but proper teaching demands that the pupil should have some reason for what he does.

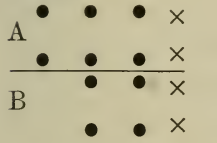
(a) *The Method of Decomposition.*—Example.—From 834 take 375.

$$\begin{aligned}
834 &= 8\text{h} + 3\text{t} + 4\text{u} = 800 + 30 + 4 = 834\\
&= 7\text{h} + 13\text{t} + 4\text{u} = 700 + 130 + 4 = 834\\
&= 7\text{h} + 12\text{t} + 14\text{u} = 700 + 120 + 14 = 834\\
375 &= 3\text{h} + 7\text{t} + 5\text{u} = 300 + 70 + 5 = 375\\
\hline
\text{Difference} &= 4\text{h} + 5\text{t} + 9\text{u} = 400 + 50 + 9 = 459
\end{aligned}$$

This method gives excellent practice in the comparison of units.

The formal step may follow exercises like the above.

(b) *The Method of Equal Additions.*—The teacher should, first by presenting the necessary truths, show the fundamental axiom upon which this method is based.



First present dots to represent the numerical value of any measured quantity. A = 6 and B = 4. The difference is seen to be 2. Then increase by adding equal numerical valuations as shown by the crosses. Through perception of this kind the pupil will gain a conception of the truth "that adding the same quantity to each does not alter the difference;" also: "that if the same measured quantity be added to two unequal measured quantities the difference will remain the same."

Example.—From 834 take 375.

Adding 10 units to 4 we have 14 units − 5 units = 9 units.

We must add a ten to the 7 tens = 8 tens. Now add one hundred = 10 tens to the 3 tens = 13 tens − 8 tens = 5 tens.

We must now add 1 hundred to the 3 hundred = 4 hundred; 8 hundred − 4 hundred = 4 hundred.

Difference = 459.

(c) *The "Make Up" Method.*—Example.—From 834 take 375.

Here 5 and what make up (10 + 4) = 9. Since we added to the top line we must add 1 ten to 7 = 8 tens.

Then 8 tens and what make (10+3) tens=5 tens. Since we added 1 hundred to minuend we must add 1 hundred to the 3 hundreds=4 hundreds. Then 4 hundred and what make 8 hundreds=4 hundreds.

The remainder is 459.

(d) *The Complementary Method.*—Example.—From 834 take 375. $\frac{834}{375}$

Here we subtract from ten each time and add the difference to the minuend digit (10−5)+4=9. We add 1 ten as before to the 7=8, (10−8)+3=5. Again add 1 hundred=4. Remainder=459.

A comparison of these methods is a good exercise in "method."

Multiplication—Multiplication may be shown in its relation to addition when the exact quantitative value of the unit is not considered. It may be shown to be a short form of addition by finding the sum of addends numerically equal to one another, and numbering them. As 5 apples+5 apples+5 apples=3×5 apples=15 apples.

When, however, the multiplicand is regarded as a derived measured quantity in terms of a standard unit, and the multiplier (times of repetition) shows the ratio of this unit to the quantity to be determined in terms of the prime unit of measure in the multiplicand, a higher stage of the evolution of number is represented as 5 ft.×3.

In this stage of measurement we repeat a derived quantity a number of times as a unit, and then by multiplication we define the total measured quantity in terms of the prime unit of measure from which the unit-multiplicand is derived. By the operation of multiplication we find a single measure

(number) that gives the same derived quantity in terms of the prime unit which derives the multiple unit.) By multiplying together the numbers which represent the measure of the derived unit and its times of repetition, we also substitute the prime unit, and the product of the numbers measures the same quantity in terms of that prime unit.

The multiplier states the times of repetition of the unit-multiplicand. The operation of multiplication does not repeat it. We multiply, obtain the product of the numbers, then use this new number to define the same measured quantity in terms of the prime unit deriving the multiple unit—the multiplicand.

Nature of Multiplication—Find the cost of 5 yds. of cloth at $3 per yard.

Here the derived unit of measure is $3, and this is to be repeated 5 times to give the measured quantity of money to be valued in the unit $1.

If now we find the product of the number 3 which measures the derived unit by the number 5 which gives the times of repetition of the derived unit, we obtain a number which values the quantity 5 yds. cloth in terms of the prime unit $1 . ·. 5 times $3 = $15.

The quantity of money is the same in each case, but the unit changes from one $3 to one $1; hence the *number varies as the measure of the derived unit* $3, *i.e.*, the number which values the quantity in terms of the prime unit is 3 times the number which values the same quantity with the $3 unit. The measure (5) that values the yards is now used

with 3 by the operation of multiplication to value the cloth in terms of the unit $1.

Steps in Multiplication—Develop the idea of times—Add 3 ft. till 36 ft. is the sum.

Emphasize the times of repetition.

Consider times in relation to the 3 ft. Then develop the number 12 as measuring 36 ft. in terms of the unit, now derived unit, 3 ft.

Now this unit of measure with the number 12 denotes the quantity, 36 ft.

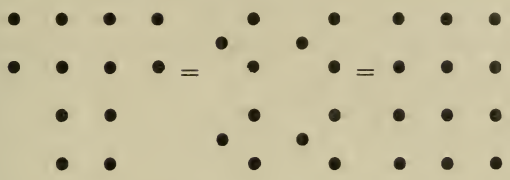
When "times of repetition" is developed and the derived unit in its relation to the number of times of repetition is understood, the defining process may be shown to depend on the memory of the products of the number that measures the derived unit, and the number that gives its times of repetition in measuring the quantity to be more definitely defined.

The pupils will see the necessity for memorizing a set of products collected and arranged as tables.

How to Teach the Tables—Derive a unit of measure, say 2 ft. and repeat it 2, 3, to 12 times, and find the sum in each case.

Pupils should first build all the tables from actual measurements, them memorize them. 2, 3, 4, 5, 10 and 11 times seem to form an easy group on account of certain recurrences, and the appearance of certain mnemonics; 6, 7, 8, 9 and twelve are more difficult. It should be pointed out that a portion of each is already learned, and here the "Law of Commutation" should be developed.

Example $3 \times 4 = 4 \times 3$ By intuitions.



This shows that 3 times 4 times a unit equals 4 times 3 times a unit = 12 times a unit.

Use should be made of this law in operations, thus avoiding incongruities arising from using the multiplicand as a repeated quantitative unit.

Multiplication may be divided into two cases.

i. When the multiplier does not exceed 12.

ii. When the multiplier exceeds 12.

Case I.—Lead up by easy examples, such as $4+4+4+4+4=4\times5=20$, to show the shortened form and give such examples as, 2×2, 22×2, 222×2 to lead up to the formal process.

Example 4632×4.

Decompose thus

(a)
$4000 \times 4 = 16000$
$600 \times 4 = 2400$
$30 \times 4 = 120$
$2 \times 4 = 8$
$4632 \times 4 = 18528$

(b)
$4000+600+30+2$
$\times\quad 4$
$16000+2400+120+8$

(c) Set out in this form

Th.	H.	t.	u.
4	6	3	2
			4
16Th	24H	12t	8u
	2Th+4h	1h+2t	8u
18Th	5H	2t	8u

(d) Final form.

4632
4
18528

Case II.—Before proceeding with this step, the pupil should feel the necessity for the new process. He has exhausted his multipliers to 12. Present the truth by dots that 13 times a number = 12 + 1, 11 + 2, or 10 + 3 times the number. The pupil will be led to see that 10 times + 3 times a number is 13 times the number. The reason for selecting 10 and 3 will also be seen.

Example.—132×13. We require 10 times and 3 times 132. Adding these, will give 13 times 132.

(a)	(b)	Final form. (c)
$132 \times 3 = 396$	132	132
$132 \times 10 = 1320$	13	13
$132 \times 13 = 1716$	$396 = 132 \times 3$	396
	$132(0) = 132 \times 10$	132
	$1716 = 132 \times 13$	1716

Show the truth by dots that 20 times a number equal 2×10 times a number, then give exercises with 10, 20, 30, 40 etc., as multipliers. Then use 23, 33, etc., and extend the principle to hundreds.

Introduce examples with noughts and give practice in the use of factors.

Show also by dots that 2 times 10 times a number is 20 times the number.

Division—When we measure a derived quantity as 15 ft. by the unit whose measure is 3 ft. we obtain a number which gives the times of repetition of the unit and which also defines the relation of the unit to the measured quantity 15 ft.

Division enables us to operate with the numbers that represent these measurements, and we find that the value of a measured quantity in terms of another

measured quantity is obtained by dividing the measure of the derived quantity by the measure of the derived unit. Division thus reverses or undoes multiplication.

The ratio and the measured quantity may be given to find the measuring unit, as divide \$15 among 3 boys, how many \$s will each get?

Here we ask what number applied to the unit "one dollar" to form a measuring unit for \$15 will give the number 3? By operating with 15 and 3 we get the co-factor 5. Then 5 applied to the unit \$1 gives \$5 the measuring unit. This is the amount for each boy.

In either case we operate with the numbers and interpret the result according to the measuring demand. In either case we can show the relation of division to subtraction by successive subtractions.

The operations in division may be divided into two cases.

i. When the divisor does not exceed 12.

ii. When the divisor exceeds 12.

Give some exercises to lead up to division and connect with multiplication.

Using the tables the pupils will soon see the converse of them, as the process depends on what was done in multiplication.

Multiplication.	Division.
$3 \times 5 = 15$	$15 \div 3 = 5$
$4 \times 6 = 24$	$24 \div 4 = 6$
$7 \times 8 = 56$	$56 \div 7 = 8$

Use the multiplication products to introduce the formal step $2\left|\frac{8}{?}\right.$; $3\left|\frac{15}{?}\right.$; $7\left|\frac{56}{?}\right.$; $8\left|\frac{72}{?}\right.$; $12\left|\frac{144}{?}\right.$

Again, in such examples as the following, the pupils will see the result without the use of new tables. $2\,|\,\frac{44}{22}$; $2\,|\,\frac{444}{222}$; $4\,|\,\frac{888}{222}$; etc.

When the tens figure will not contain the divisor evenly then separate as follows :—

$$216 \div 2 = 2\,|\,\frac{200+10+6}{100+5+3} = 108$$

Use numbers from 1 to 12 by the formal method.

The so called "Long Method" of short division will not seem necessary if the implied inverse of multiplication which is now made explicit in division is thoroughly understood. The long method of short division may be used to relate the old and new when "long division" is introduced.

Case I.—Divide 816 by 6. Decompose the dividend to show multiples of 6 thus :—

$$6\,|\,\frac{600+180+36}{100+30+6}$$

Express shortly thus :—

$6\,|\,\frac{816}{136}$ Explanation: 6 is contained in 8 one time and 2 over. This 2 makes 20 of the next lower order which with the 1 make 21. Now 6 is contained in 21, 3 times and 3 over. This 3 makes 30 of the next lower order which with the 6 makes 36. Lastly 6 is contained in 36, 6 times.

Since the product and remainder are obtained mentally, this method is called "Short Division."

Case II. (When the divisor is greater than 12.)

This process of division may be shown to be the exact converse of multiplication just as in the smaller

examples when using the tables we found that $4 \div 2 = 2$, was the converse of $2 \times 2 = 4$.

Suppose we wish to divide by 13.

i. We might build a table and carry on the divisions as before, but, as many larger numbers will occur, it is best to introduce the new method at once.

ii. As we have seen, division is the inverse of multiplication; multiply 132 by 13, *i.e.*:

$$\begin{array}{rrl} \text{Multiply } 100+30+2 \text{ by } 13 & = & 100\times13=1300 \\ \qquad\qquad 13 & & 30\times13=\ 390 \\ \hline & & 2\times13=\ \ 26 \\ \hline 1300+390+26 & = & 132\times13=1716 \end{array}$$

Now divide 1716 by 13.

$$\begin{array}{rrrrr} 1716 \text{ less } & 100\times13= & 1716- & 1300= & 416 \\ 416 \ \text{“} & 30\times13= & 416- & 390= & 26 \\ 26 \ \text{“} & 2\times13= & 26- & 26= & 0 \end{array}$$

1716 less $(100+30+2)\ 13 = 0$

Again: $13 \mid 1300+390+26$

$100+30+2 = 132.$

Again: Let it be required to divide 1716 by 13.

From 1716 subtract $13\times100=1716-1300=416$ remainder after 100 subtractions.

From 416 subtract $13\times30=416-390=26$ remainder after 30 subtractions.

From 26 subtract $13\times2=26-26=0$ remainder after 2 subtractions.

Hence there have been 132 subtractions in all, or the quotient of 1716 by 13 is 132.

This principle of subtractions may now be stated in tabular form as follows:

(*a*) 13 ⟌ 1716 | 100+30+2 (*b*) 13 ⟌ 1716 | 132

1300		13	
416		41	
390		39	
26		26	
26		26	
0			

The pupils will soon adopt the formal process and extend to larger numbers.

Practice should be given in the use of the trial divisor and trial dividend.

The pupils should frequently build a table of 1, 2, 3—9 times, the divisor.

Division by factors, and finding the correct remainder:

Example.—Divide 48362 by 42.

One pair of co-factors is 6×7. Hence divide first by 6 and this quotient by 7.

6 | 48362

7 | 8060 = 2 units remain and 8060 (sixes) as quotient.

1151 = 3 sixes remain and 1151 (forty twos) as quotient.

∴ the remainder $= 3 \times 6 + 2 = 20$.

Again: Divide 39265 by 105. The factors are $3 \times 5 \times 7$.

3 | 39265

5 | 13088 = 1 (unit) remains and 13088 (threes) as quotient.

7 | 2617 = 3 (threes) remain and 2617 (fifteens) as quotient.

373 = 6 (fifteens) remain and 373 times (one hundred and five) as quotient.

∴ Remainder $= 1 + (3 \times 3) + (6 \times 15) = 1 + 9 + 90 = 100$.

Pupils may now deduce the rule for finding the correct remainder.

Proofs, short methods, and arithmetical terms connected with the simple rules should now be systematically dealt with. The terms, addend, etc., should be inductively developed, but no formal definition should be demanded.

The idea is to furnish the pupil with a language which to him has meaning.

Compound Quantities—When a quantity has been measured by, and written in terms of units irregularly derived from one another, but which are so related that each of the larger is measured by the unit next smaller than itself we call the quantity a "compound quantity."

The operation by means of which we can change the unit value of these compound quantities is called "reduction."

Pupils should make their own measurements, first deriving these aggregates and then expressing them in terms of a single unit of lower or higher value. They will soon discover a reason for reduction.

The need for adding, subtracting, multiplying and dividing will be felt when the stage of measurement and operations are related.

The operations used in defining those measurements are called the "Compound Rules."

The calculations arising from these quantities are very essential. The pupil should study the rules for the fact knowledge necessary in practical life. In the simple rules we are dealing with quantities formed by one regular denomination (ten) and having

a value dependent on the position of the digits expressing the numbers.

We have a number value indicated by the symbol and a local value known by the relative position of the symbol. In 234 we have $200+30+4=2\ (10)^2+3(10)+4$. This shows the 10 times increase in value as we go to the left.

Compound Quantities :—In compound quantities there are two elements to consider, the relation of the measuring unit, and the ten ratio in the number. The operations in consequence are called "compound."

In measuring quantity such as extension, linear, superficial, cubical measure, capacity, weight, time, angularity, and value, we use standard conventional units, but they bear no definite relative value to each other. They are for the most part irregular and variable.

Considerable practice should be given in this department of the work. Attention should be given to the varying unit. The number element will be seen to depend on the same measuring process already mentioned—quantity-unit-number.

Develop objectively the units and associate the measuring value of the unit with the name. Each unit that can be conveniently developed in the school room should be taught objectively. The units should be used in actual experience in measuring, weighing, counting, etc.

Bring out the relative value of the pint, quart, gallon, peck and bushel. Use the actual measures. Secure a large box of fine sawdust for the school room. Let pupils make lists of things measured,

weighed, counted, etc. Deal with the actual quantities.

Give, as far as possible, definite ideas of linear units and apply them directly in measuring. Also give definite ideas of surface, square inch and its relation to a square foot. Then develop square measure (two dimensions) from linear measure (one dimension), and cubic measure (three dimensions) from linear and square measure.

Use exact units and drawings, until terms used are charged with meaning.

Give simple problems with one denomination to impress the fact that these quantities can be defined more accurately by operating with the numbers that value them.

Pupils should measure quantity; establish the ratio, build the table, write it neatly, and then memorize it; but in memorizing no set order should be used exclusively.

Reduction—changing unit value—will now follow, showing that quantities derived by using certain units may be derived by using one or various units in the same scale. The number depending on a unit will of course vary, but the quantity will remain the same.

Pupils should have practice in deriving quantity with different units.

Let pupils measure a quantity 3 gallons, again 12 quarts, again 24 pints. Such experience will lead up to reduction, and show the reason for the process.

Reduction will be seen as the operation that changes the number value of a quantity when the unit of measure changes.

The teacher, having led the pupils to comprehend the number, will now develop and make clear the operations, addition, subtraction, multiplication and division, in the use of these numbers.

The order is, first derive numbers from quantity, then bring about the facility by using the numbers in the operations.

Reduction may be formally treated as indicated by the following examples.

The two kinds of reduction—reduction descending, valuing a measured quantity in terms of a lower unit, and reduction ascending, valuing a measured quantity in terms of a greater unit—are inverse processes, either of which may be used to verify the other. In the first we operate with the numbers by multiplying; in the second by dividing.

Let it be required to change 12 yards 2 feet 9 inches to inches. We here find it convenient to illustrate once more the "Law of Commutation."

——— = • • •
——— = • • •
——— = • • •
——— = • • •

Suppose each line to represent 1 yard = 3 feet as shown by dots.

Thus we see that 4 yards = 3 times 4 times 1 foot = 4 times 3 times 1 foot.

Hence by this law either factor may be used as multiplier, *i.e.*, 4×3 (1 foot) or 3×4 (1 foot).

12 yds. 2 ft. 9 in.
3
38 feet
12
465 inches

As there are 3 feet in 1 yard, in 12 yards there are 12×3 (1 foot) or 3×12 (1 foot), (Law of Commutation).
= 36 feet; 36 feet + 2 feet = 38 feet.

Again: in 1 foot there are 12 inches ∴ in 38 feet there are 38×12 (1 inch) or 12×38 (1 inch) = 456 inches and 456 inches + 9 inches = 465 inches ∴ 12 yards, 2 feet, 9 inches = 465 inches.

Let it be required to change 632 inches to yards, feet, and inches.

12 | 632 inches
3 | 52—8 inches
17—1 foot

Since there are 12 inches in 1 foot, there will be as many feet in 632 as 12 is contained in 632. $632 \div 12 = 52$ (feet) and 8 inches remaining. Again: since there are 3 feet in 1 yard, there will be as many yards in 52 feet as there are times 3 feet in 52 feet; 52 feet $\div$ 3 feet = 17 times 1 yard, and 1 foot remaining. Hence 632 inches = 17 yards, 1 foot, 8 inches.

These operations may be compared with the notation system in the operations called the four simple rules.

Compound Addition

				H	T	U		H	T U
(*a*)	6	7	3	(*b*) 6	7	3	(*c*) 6	7	3
	4	3	4	4	3	4	4	3	4
	7	8	5	7	8	5	7	8	5
	1892			17, 18, 12			18, 9, 2		

From previous knowledge the pupil can readily and accurately add such questions as (*a*). By separating the columns as in (*b*) the pupil makes more definite the process that has been in use in (*a*). He obtains as sum 17H, 18T, 12U.

He now makes explicit the ten ratio and 12 units are seen as 1t and 2u. The 2 numbering the units is placed under the units column and the ten added

with the tens, making 19. This is again seen as 1 hundred and 9 tens. The 9 tens are placed under the tens column and the hundred with the hundreds, making 18 hundred.

The result is now expressed in the customary form as in (*c*).

The pupil will now be in a position to extend this knowledge to compound addition, and can relate the old and new, attending particularly to the varying ratio, the chief new element.

Derive by actual measurements the quantities 3 yards, 1 foot, 4 inches; 2 yards, 2 feet, 7 inches, and 4 yards, 1 foot, 8 inches. Now define the whole quantity by adding, then measure again to verify the result.

(*d*)

yds.	ft.	in.
3	1	4
2	2	7
4	1	8
9	4	19

(*e*)

yds.	ft.	in.
3	1	4
2	2	7
4	1	8
10	2	7

Note that as in simple addition, quantities expressed in the same unit value are placed in the same column.

In (*d*) we first add as in (*b*) obtaining 9 yards, 4 feet, 19 inches as in (*d*).

The pupils know that 19 inches = 1 foot, 7 inches. We then have 5 feet = 1 yard, 2 feet. Again, 9 yards and 1 yard = 10 yards. The sum is now shown as in (*e*).

The other operations may be similarly related to the remaining simple rules, and the new point in

each of the compound rules emphasized and developed by the pupil.

Greatest Common Measure—If the measuring idea has been carried out, the relation of the unit to the thing measured will be familiar to the pupil. The unit will be looked upon as the measurer.

There will now be an opportunity for giving special attention to exact measurement by measuring measured quantities with a measured unit. The way is thus prepared for "Greatest Common Measure" and "Least Common Multiple."

By actual measurement, let the pupils derive with a measured unit certain measured quantities. By this actual measuring process the terms, measure, "multiple," "common measure," "common multiple," "greatest common measure," "greatest common factor or divisor," "least common multiple," sub-multiple, prime factor, and composite factor, can be educed.

The formal process may then be introduced.

Let the pupils derive 15 feet with the foot unit, also derive 3 feet, 5 feet.

Let them now measure 15 feet with the 3 ft. unit, and the 5 ft. unit (a higher stage of measurement, because a derived quantity 15 feet is measured by a derived quantity 3 feet, or 5 feet).

Lead the pupils to discover that the greatest derived quantity that will exactly measure two or more derived quantities is their greatest common measure, and that the number defining this common measure is the greatest common factor, or divisor of the numbers that value or define the multiple quantities.

Suppose that 12 feet and 18 feet are two derived quantities of which 12 and 18 are the number values.

Now the derived quantities 2 feet, 3 feet, 4 feet, 6 feet and 12 feet will exactly measure 12 feet, and the derived quantities, 2 feet, 3 feet, 6 feet, 9 feet, and 18 feet, will exactly measure 18 feet; therefore the numbers 2, 3, 4, 6 and 12 are divisors or factors of 12, and the numbers 2, 3, 6, 9 and 18, are divisors or factors of 18.

Now 6 feet is seen to be the greatest common measure of the quantities 12 feet and 18 feet. Also 6 is the greatest common divisor of the numbers 12 and 18 which value these quantities.

Lead the pupils to discover, that, in measuring a derived quantity 15 feet by a derived unit of measure 3 feet, or 5 feet, the 15, 3 and 5 are the numerical values of the measured quantity and the measuring units. Then establish the principle that if one derived quantity exactly measures another derived quantity, the number that defines the unit of measure is a factor of the number that measures or defines the multiple quantity, and, that the number that defines the multiple quantity, is a multiple of the number that measures or defines the unit of measure.

After this has been clearly brought out, we can perform the operations of multiplication and division on the pure number symbols, knowing that they represent relational values in the above measuring process, and that in place of actual measurement we may mentally perform the operations with the numbers to the neglect of the measurement. Impress

that in operating we imply the actual measurement which may be stated when necessary.

Working now with pure numbers as representing the above measurements we may proceed to find the H.C.D. of numbers easily factored.

(*a*) Factor Method.—Take the numbers $35 = 5 \times 7$ and $77 = 11 \times 7$.

The pupil sees that 7 is a factor of both and that it is the H.C.D. He must now translate this into the measuring process , , if a quantity measured by a unit = 77 times that unit, and another quantity measured by the same unit gives 35 times that unit, then the greatest common measure of these quantities is 7 times the same unit.

(*b*) Formal Process.—By finding all the prime factors of small numbers it is easy to find the C.F.'s and H.C.F. of these numbers.

Take the numbers 16 and 24. The factors of 16 are 2, 4, 8 and 16; and of 24, 2, 3, 4, 6, 8, 12 and 24. Hence 2, 4 and 8 are seen to be common factors and 8 the G.C.F.

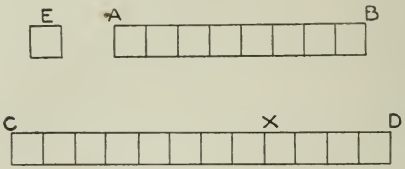
(*c*) Prime Factors—Now take 60 and 72. To find all the factors would be lengthy, hence find the prime factors.

$60 = 2 \times 2 \times 3 \times 5 = 2^2 \times 3 \times 5$ and $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$

Let class note that, (1) factors must be prime, (2) that the divisors and last quotient constitute all, (3) that their products give the original numbers; *i.e.*, $2^3 \times 3^2 = 72$, and $2^2 \times 3 \times 5 = 60$.

Discover the following:—The product of the lowest powers of those factors which are common to all, is the G.C.D.

(*d*) Long Method.—The fundamental truth on which this method depends may be placed before the pupils in this way.



Let AB and CD be two measured quantities in terms of E.

Now E measures AB, CD, and also XD their difference. It also measures AB+CD. It also measures any number of times A B, any number of times CD, any number of times their sum or difference.

Hence the truths. If a measured quantity as a unit measures two measured quantities derived from the same unit as the unit of measure, then that measured unit will measure the sum or difference of the two quantities or any multiple of any of them.

Also :—The number representing the value of the measuring unit will be a Common Factor of the sum and difference of the numbers representing the value of the two measured quantities or any multiple of these quantities.

Introduce the "long method" by using 2 small numbers say 33 and 72.

Divide as in the process until there is no remainder.

We get 72, 66, 33, 30, 6, 3 from the operation.

It is seen that 3 will divide 6 and hence the

others, since they are all multiples of 3. It is found also to be the only number that divides all without a remainder. Hence 3 is the H.C.D. as may be easily seen by resolving the numbers into their prime factors.

"The truth explained and reason of the process shown."

Take $144 = 48 \times 3$, and $240 = 48 \times 5$.

48×3	1	48×5
48×2	1	48×3
(48×1)	2	48×2
		48×2

It is seen that 48 is a factor of every dividend and remainder. It is therefore common and from what has been said can be easily shown to be the H.C.D.

The truth established may now be illustrated by pure numbers.

Take $35 = 7 \times 5$, and $84 = 7 \times 12$. From this we can show 7 to be a factor of 35; 84; their sum; their difference, and any multiple of 35 or 84, or any multiple of their sum or difference.

Suppose now we wish to find the H.C.D of 3149 and 26179. We are obliged to adopt some method other than factoring. We use this long method.

"Divide the smaller into the larger and continue until there is no remainder" (see text book). The last divisor will be the H.C.D.

3149	8	26179
2961	3	25192
188	5	987
188	4	940
		47

From this we see according to the principle established that the number required measures 47, 188, 940, 987, 2961, 25192, 3149 and 26179.

Now 47 is seen to be a factor of all these and since it is the greatest factor of itself and must

contain the H.C.F. it follows that 47 is the H.C.F. required.

Space will not permit a more detailed statement.

Three or more numbers may be similarly dealt with. Short, neat, compact methods of using this process should be given.

Least Common Multiple—After developing the terms multiple, etc., the class will be prepared to find the L.C.M. of two or more numbers.

Impress that one defined quantity is a multiple of another defined quantity when that other quantity exactly measures it. Extend this measuring idea to "common multiple" and "least common multiple."

It may be seen that some of the multiple quantities of 2 feet, are 2 feet, 4 feet, 8 feet, 10 feet and 12 feet, and that some of the multiple quantities of 3 feet, are 3 feet, 6 feet, 9 feet, 12 feet.

The numbers 2, 4, 6, 8, 10 and 12 are multiples of 2, and the numbers 3, 6, 9 and 12 are multiples of 3; 6 and 12 are common multiples, and 6 is the least common multiple. The L.C.M. of numbers prime to each other is their product.

To find the L.C.M. of 18, 24 and 30. Express them in their prime factors.

$18=2\times3\times3$; $24=2\times2\times2\times3$; $30=2\times3\times5$. Then $(2\times3\times3)\times(2\times2\times2\times3)\times(2\times3\times5)=12960=$ their product is seen to be a multiple of 18 because it contains the prime factors of 18; also of 24 because it contains the prime factors of 24; also of 30 because it contains the prime factors of 30. Hence 12960 is a common multiple. Now discover the *L.C.M. of 18, 30 and 24.* It is plain that $(2\times3\times3)$ is a multiple of 18, and that $(2\times3\times3)\times(2\times2)$ is a multiple of

24 as it contains all the prime factors of 24, $(2\times3\times3)\times(2\times2)$ is a common multiple of 18 and 24, and $(2\times3\times3)\times(2\times2)\times5$ is a multiple of 30 since it contains all the prime factors of 30. It is therefore a common multiple of these three numbers and it must be the "least common multiple" because the least number possible of prime factors is taken to produce it.

The L.C.M. of 18, 24 and 30 is therefore $(2\times3\times3)\times(2\times2)\times5=360$.

The formal method of finding the L.C.M. may now be given. (See text book).

Find the L.C.M. of 16, 30 and 36.

First find prime factors.

$16=2^4$; $30=2\times3\times5$; $36=2^2\times3^2$

The L.C.M must contain $2^4\times3^2\times5=720$, ∴ 720 is the L.C.M.

We have the following rule: "The product of the highest powers of all the factors that occur will be the L.C.M."

To find the L.C.M. of 396 and 814 (larger numbers) $396=22\times18$; $814=22\times37$.

The L.C.M. must contain 22 and 18, also 22 and 37, ∴ the L.C.M. is $22\times18\times37$. That is 396×37 = L.C.M. But $37=\frac{814}{22}$

By substitution $\frac{396\times814}{22}=$ L.C.M.

Since 22 is the H.C.F. we have the following formula $\frac{A\times B}{D}=$ L.C.M. where A and B represent two measured quantities and D their G.C.M.

This method may now be extended to three or more numbers. Give practice problems to secure

interest, rapidity and accuracy, in order to prepare the way for the use of H.C.D. and L.C.M. in fractions.

Recapitulate: Find H.C.D. and L.C.M. of 16335 and 18018.

Resolve into prime factors. $16335 = 3^3 \times 5 \times 11^2$; $18018 = 2 \times 3^2 \times 7 \times 11 \times 13$.

From generalizations the H.C.F. is $3^2 \times 11$ and the L.C.M. must contain $2 \times 3^3 \times 5 \times 7 \times 11^2 \times 13$.

Hence the L.C.M. is $2 \times 3^3 \times 5 \times 7 \times 11^2 \times 13$.

Fractions—The term fraction seems to be used in a variety of ways as "one or more of the equal parts of a unit," an unperformed division; a ratio between two quantities; a number indicating and explicitly stating the measuring process by means of which the number idea is developed in defining quantity.

In the treatment of fractions, the continuity of the measuring process giving rise to a higher development through a uniform adjustment of activity should be recognized.

The teacher who examines the nature of the above statements will have no difficulty in deciding on a method of teaching the science and art of this department of arithmetic.

If fractions are considered as parts of things, and have only a qualitative meaning, if the ratio implied is eliminated by concreting the unit, if the sub-unit (fractional) is not compared with the prime unit, if the terms of the fraction merely represent unperformed operations, or if the thought power that this stage of measurement demands is not developed,

fractional work fails to perform its true function as a branch of arithmetic.

Concrete treatment may serve as an introduction but the power of abstraction and generalization must be increased by a proper development of the number idea according to the stage of mental evolution demanded. The process of this stage of measurement must aid abstract thinking. Ratioing by comparing magnitudes should be prominent. There should be a training in relating—the very essence of fractions.

Fractions should be viewed as a continuation of the early stages of making a vague whole definite by finding the parts (analysis) and relating the parts (synthesis).

The idea is the same in fractions. What was implied—ratio—in counting became explicit in multiplication and division; and now in fractions it is not only more explicitly brought out but it is more adequately expressed by the notation of fractions. The fraction idea involved in the early stages of counting is now made more definite, and not only should the teaching give the numbers designating the terms of the fraction, but the modification of one through the other.

What then is a fraction according to its use in making definite this stage of measurement?

An examination of $\frac{5}{6}$ will show the complex idea involved therein.

The pupil must first think 5 (say) then 6, then the unit $\frac{1}{6}$, then the relation $\frac{5}{6}$.

The proper teaching of fractions should reinforce the pupil with his past knowledge and power in

deriving quantity, and emphasize the ratio idea now prominent, thereby sustaining that continuity which gives rise to the unity of the subject.

"A fraction may be considered as a convenient notation for expressing quantity in terms of the process which measures or defines it."—"Psychology of Number."—*McLellan & Dewey.*

A fraction is a number in which the unit of measure is a definite part of some primary unit."—"McLellan's Public School Arithmetic."

"A fraction is one or more times the reciprocal of an integer."—*Graham.*

When a pupil in aggregating thinks explicitly 5 in terms of its own unit, it is an integer.

When he thinks the unit in terms of 5 it is a fraction.

"How a fraction is derived according to the measuring process as indicated by the notation." Any unit may be used but the primary unit should be a measured unit.

For convenience the linear foot is used.

Let A B represent 1 foot.
Let C represent 1 inch
D, unmeasured, D_2 = D, now measured.

By comparison, analysis and synthesis the pupil derives a new sub-unit from the primary standard unit and conceives its relation thereto. A new demand is made in numbering and unless these standards of comparison are set up in the mind, the work does not amount to more than "ciphering," and

the operations lead to a mere conjuring with numbers.

AB = 12 obtained by adding = 12 times 1 obtained by multiplication (the times idea becoming prominent).

The "one" is conceived to be one of the twelve $\frac{1}{12}$. His conception of this relation is the new working product of the mind. The $\frac{1}{12}$ becomes a sub-unit. There was a synthesis for the 12, an analysis for the 1 and a conception of the relation of the discriminated part—one—to the related parts —a whole—of twelve ones. In applying this $\frac{1}{12}$ to D we find it repeated 5 times = 5 times (the unit); but since the sub-unit is a unit whose relation to the primary unit from which it is derived is indicated by $\frac{1}{12}$, we notate or express the complete measurement this way $\frac{5}{12} = 5$ times the sub-unit whose relation to the primary unit 1 foot and whose name or denomination is indicated by the symbol 12. In $\frac{5}{12}$ we have the following: 12 shows the number of sub-units in the primary unit and names the sub-unit as $\frac{1}{12}$. It also implies the relation of the primary unit to the sub-unit. The 5 shows the times of repetition of the sub-unit in measuring the quantity D and implies the relation D, to C, and through the 12 shows the relation of the new measured quantity D_2 to the prime unit 1 foot.

This view of fractions demands a certain kind of mental exercise. The mind is kept close to the necessary truths whose beauty alone forms an element of the ideal; the known experience of to-day is used in interpreting to-morrow's. Both number, and definite quantitative relations are presented.

Quantity and fractions are not divorced. Every symbol and indicated operation can be and should be translated into meaning. Accuracy and skill in manipulations are not to be overlooked. Memory is not to be burdened by arbitrary rules—"Invert the divisor."

The thinking faculty is invigorated, strengthened and developed by orderly, consecutively, logically arranged material, presented in such a way as to cause a normal mental reaction demanded by this stage of measurement.

Teaching Fractions—The pupils are familiar with the measuring idea, with number as a tool of measurement, and are prepared to extend this measuring idea.

In teaching fractions bring out the analysis of a whole and the synthesis of the parts.

Draw attention to times of repetition of parts as $\frac{3}{4}=3$ times $\frac{1}{4}$ not merely 3 out of 4. Use equal objects freely and give exercises in comparing denominate quantities. Write tables reciprocally, 1 yard $=3$ feet; 1 foot $=\frac{1}{3}$ yard.

Increase power by deriving quantity from environment. Refer symbols and operations frequently to actual measurements before operating.

Let statements be illustrated and given afterwards in clear, consistent, concise language.

Introduce lessons orally and when symbols can be translated into measurements, give clear written statements of the work. Discover relations and use numbers to express them.

Give plenty of practical problems and let pupils frequently construct problems for themselves. Use shortest methods and avoid stereotyped solutions.

1st Lesson in Fractions—Fold kindergarten paper (4 inch squares) to give an idea of the parts of a quantity without a physical analysis.

Use measures, quart, etc., to give an idea of equal parts.

By using lines, and measuring, develop equal parts, notation, and terms.

Let pupils draw 5 lines, each 1 foot long and measure them with 1, 2, 3, 4 and 6 inch measures. Discover the equal parts in each, and what part (the relation) each is to the whole.

Express these parts as 1 out of 2, etc., and name them as one half, etc. Introduce the notation $\frac{1}{2}$, etc.

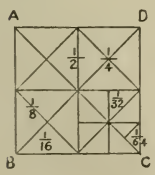
Show $1=\frac{2}{2}=\frac{3}{3}=\frac{4}{4}=\frac{6}{6}=1\frac{2}{2}$, etc., and $\frac{1}{2}=\frac{2}{4}=\frac{3}{6}=1\frac{6}{12}=\frac{12}{24}$, etc.

Develop meaning of numerator and denominator, *top one names = number of parts taken = numerator; bottom one numbers and names parts in the prime unit = denominator.*

"A fraction is a number in which the unit of measure is a definite part of some primary unit of the same kind."

"The denominator shows into how many parts the primary unit is divided to give the direct unit of measure. It also names the parts."

"The numerator shows the number of them that measures the quantity.—*McLellan and Ames.*



Let ABCD be a definitely measured quantity.

Divide and color with chalk.

Compare, group and relate by diagram $\frac{1}{2}$ of $1=\frac{1}{2}$; $\frac{1}{2}$ of $\frac{1}{2}=\frac{1}{4}$; $\frac{1}{2}$ of $\frac{1}{4}=\frac{1}{8}$; $\frac{1}{2}$ of $\frac{1}{8}=\frac{1}{16}$; $\frac{1}{2}$ of $\frac{1}{16}=\frac{1}{32}$.

By the use of diagrams intrinsic interest attaches to the operations, and variety is secured.

Steps in Fractions—Development of the idea and terms of a fraction; development of certain fundamental truths giving rise to rules of operation.

Operations:—Reduction, addition, subtraction, multiplication and division.

Quantity may be derived by measuring with prime, multiple, fractional, and combined units.

If the unit changes the number defining the same quantity will accordingly vary.

By actual measurement and the presentation of the implied relations, the pupils will conceive the truths which give rise to the following principles of operation.

The operation which changes the unit of derived quantities without altering their value is called "Reduction."

We have the following reductions:

A whole number to a fraction; a fraction to a whole number; a fraction from higher to a lower unit value; a fraction from a lower to a higher unit value; mixed numbers to improper fractions; improper fractions to mixed numbers; fractions to a common unit value, fractions to a common number value (same numerators) fractions to a higher unit value; a set of fractions to any unit value.

We reduce to define more definitely, or to aid in performing the operations.

We have 6 important principles to some one of which the rationale of every fractional process can be traced. These principles should all be illustrated by diagram and connected with quantity as explained in No. 1.

I. Measure any line AB by $\frac{1}{30}$ of AB = 30 units, by $\frac{1}{10}$ of AB = 10 units; by $\frac{1}{5}$ of AB = 5 units.

Now take AC (say) $\frac{6}{30}$ of AB $= \frac{2}{10}$ of AB $= \frac{1}{5}$ of AB.

$\frac{6}{30} = \frac{2}{10} = \frac{1}{5}$; that is $\frac{2 \times 3 \times 1}{2 \times 3 \times 5} = \frac{2 \times 1}{2 \times 5} = \frac{1}{5}$

Cancelling the 2's and 3's we have $\frac{1}{5} = \frac{1}{5} = \frac{1}{5}$:

From the measurement we find that if a unit becomes $\frac{1}{3}$, $\frac{1}{5}$, etc., as great the number valuing the same quantity becomes 3 times, 5 times, etc., as large.

The converse is true. Hence we have the following principles of operation for reducing fractions. "Multiplying, or dividing both numerator and denominator of a fraction by the same number leaves the value unaltered."

The pupil should see the truth and see that his operations must verify it.

Rules: (1) By multiplying the numerator by an integer, we multiply the value of the fraction by that number; as

$$\frac{24}{6} = 4; \quad \frac{24 \times 2}{6} = 2 \times 4 = 8.$$

(2) By dividing the numerator by an integer we divide the value of the fraction by that number; as,

$$\frac{24}{6} = 4; \quad \frac{24 \div 2}{6} = 4 \div 2 = 2.$$

(3) By multiplying the denominator by an integer we divide the value of the fraction by that number; as,

$$\frac{24}{6} = 4; \quad \frac{24}{6 \times 2} = 4 \div 2 = 2.$$

(4) By dividing the denominator by an integer we multiply the value of the fraction by that number; as,

$$\frac{24}{6} = 4; \quad \frac{24}{6 \div 2} = 4 \times 2 = 8.$$

Reduction of Fractions—I. Reduce 5 feet to 4ths. (Illustrate by line).

Operation.

1 foot = 4 units

5 ft. = 5 × 4 units = 20 units

5 ft. = $\frac{20}{4}$ ft.

Explanation.—We here wish to express 5 feet in terms of the unit $\frac{1}{4}$ foot. Since 1 foot contains 4 units, 5 feet contain 5 × 4 units = 20 fourths = $\frac{20}{4}$.

II. Reduce $\frac{60}{72}$ to its lowest terms.

Operation

$$\frac{60}{72} = \frac{30 \times 2}{36 \times 2} = \frac{15 \times 2 \times 2}{18 \times 2 \times 2} = \frac{5 \times 3 \times 2 \times 2}{6 \times 3 \times 2 \times 2}$$

Since $\frac{12}{72} = \frac{1}{6}$

$$\frac{60}{72} = \frac{60 \div 12}{72 \div 12} = \frac{5}{6}; \text{ or } \frac{5 \times 12}{6 \times 12} = \frac{5}{6};$$

Explanation:—Fractions are in their lowest denomination (greatest unit) when the terms are prime to each other.

Hence divide both terms by their H.C.F.

III. Reduce $\frac{4}{5}$ to 15ths (lower denomination).

Operation.

$1 = \frac{15}{15}$

$\frac{1}{5} = \frac{3}{15}$, therefore $\frac{4}{5} = 4$ times $\frac{3}{15} = \frac{12}{15}$;

Explanation.—$\frac{1}{5} = \frac{3}{15}$; hence $\frac{4}{5} =$ 4 times $\frac{3}{15} = \frac{12}{15}$; or the ratio of 5ths to 15ths being 3, there are 3 times as many 15ths as 5ths in any number. Hence $\frac{4}{5} = 3$ times $\frac{4}{15} = \frac{12}{15}$.

IV. Reduce $8\frac{3}{5}$ to an improper fraction.

Operation.

$1 = \frac{5}{5}$

$8 = 8 \times \frac{5}{5} = \frac{40}{5}$;

$\frac{40}{5} + \frac{3}{5} = \frac{43}{5}$

Explanation.—We here wish to express the integral part of the number in terms of the fractional unit $\frac{1}{5}$ and then

combine it with $\frac{3}{5}$ to make one fraction. Since in 1 there are $\frac{5}{5}$, in 8 there are 8 times $\frac{5}{5} = \frac{40}{5}$; $\frac{40}{5} + \frac{3}{5} = \frac{43}{5}$.

V. Reduce $\frac{47}{5}$ to a mixed number.

Operation.

5 fifths = 1 unit
1 fifth = $\frac{1}{5}$ unit
47 fifths = $\frac{45+2}{5}$
= 9 prime + 2 sub-units = $9 + \frac{2}{5}$
= $9\frac{2}{5}$

Explanation. — Here we wish to express the number in terms of the primary and derived sub-unit. Since in any number there are $\frac{1}{5}$ as many "ones" as there are 5ths, in $\frac{47}{5}$ there are $\frac{1}{5}$ of 47 ones = $9\frac{2}{5}$

Addition and Subtraction—At this stage the pupils have the idea of a fraction; the terms are understood; the notation is significant. They have also gained power in deriving quantity, in using different units, in comparing these units with the primary unit, and in valuing the times of repetition of these units. They have a knowledge of the terminology in which these stages of measurement are expressed and they have gained skill and accuracy in manipulating the symbols which express the number values of these quantities.

Addition of fractions will present little difficulty. The idea of aggregating—finding as a whole a quantity made up of parts—may now be connected with the pupil's past experience in simple addition. Parts of a whole valued in different fractional units are now to be aggregated.

Note connection with the simple rules.

Steps in Addition of Fractions

(*a*) $\frac{1}{4}, \frac{3}{4}, \frac{5}{4}$; (*b*) $\frac{1}{2}, \frac{3}{4}, \frac{5}{8}$; (*c*) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$; (*d*) $13\frac{1}{2}, 24\frac{2}{3}$.

In dealing with the operations in fractions the numbers only will be used. Each number should be derived from quantity, and the necessity and reason for the particular operation determined by the pupils before beginning to operate.

This should be done until every operation is significant as a means of indicating or defining certain modes of measurement.

(*a*) Find sum of $\frac{3}{4}, \frac{5}{4}, \frac{6}{4}$.

Operation.

$$\frac{3}{4}+\frac{5}{4}+\frac{6}{4}=\frac{3+5+6}{4}=\frac{14}{4}.$$

$$\frac{14}{4}=\frac{4}{4}+\frac{4}{4}+\frac{4}{4}+\frac{2}{4}=1+1+1+\frac{2}{4}=3\frac{2}{4}=3\frac{1}{2}.$$

(*b*) Find sum of $\frac{1}{2}, \frac{3}{4}, \frac{5}{8}, \frac{7}{16}$.

Operation.

$$\frac{1}{2}+\frac{3}{4}+\frac{5}{8}+\frac{7}{16}=\frac{8}{16}+\frac{12}{16}+\frac{10}{16}+\frac{7}{16}:$$

$$=\frac{8+12+10+7}{16}=\frac{37}{16};$$

$$\frac{37}{16}=2\frac{5}{16}$$

Explanation:—$\frac{1}{16}$ is seen to be a measure of each of the units $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$, and as it is a measure of the equals, the number 16 which names and shows the relation is a multiple of the numbers 2, 4 and 8 which define the other units. Now having valued each of the above in terms of the unit $\frac{1}{16}$ we can aggregate as in (*a*).

(*c*) Find sum of $\frac{3}{4}$, $\frac{2}{3}$, $\frac{5}{6}$.

Operation.

Since $1 = \frac{12}{12}$, $\frac{3}{4} = \frac{9}{12}$; $\frac{2}{3} = \frac{8}{12}$; $\frac{5}{6} = \frac{10}{12}$;

$$\frac{3}{4} + \frac{2}{3} + \frac{5}{6} = \frac{9+8+10}{12} = \frac{27}{12};$$

$$\frac{27}{12} = \frac{24}{12} + \frac{3}{12}$$

$$= 2 + \frac{1}{4} = 2\frac{1}{4};$$

Explanation.—We first find a unit that will exactly measure $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{6}$. We find this unit to be $\frac{1}{12}$, because 3, 4, 6, are factors of the number 12.

Hence the above can all be valued in terms of the unit $\frac{1}{12}$ and can therefore be aggregated.

We now discover the following facts: (1) to add we require the same unit, (2) the new unit is a measure of the others, (3) its denominator is a multiple of the other denominators, (4) the number varies with the unit. (5) We conclude to use the first multiple of the denominators.

Hence the rule: To add fractions reduce them to the same unit value by finding the L.C.M. of the denominators and then adding the new numerators.

(*d*) Find the sum of $13\frac{1}{2}$ and $24\frac{3}{8}$.

Operation.

$$13\tfrac{1}{2} + 24\tfrac{3}{8} = (13+24) + \tfrac{1}{2} + \tfrac{3}{8}$$

$$= 37 + \tfrac{1}{2} + \tfrac{3}{8}$$

$$= 37 + \tfrac{4}{8} + \tfrac{3}{8}$$

$$= 37\tfrac{7}{8}$$

Explanation. — Add the numbers representing the primary unit and proceed as before with the fractional numbers. Avoid when possible reducing mixed fractions to improper fractions before performing the operations—addition and subtraction.

Subtraction—Since addition implies subtraction, the one being the inverse of the other, it will not be necessary to go through a set of examples as in

addition. These operations should not be separated. They should be taught as correlative phases of the same measuring process. The subtraction is implied while the pupil is dealing explicitly with addition.

As the pupil will make better progress with one thing at a time, addition may first receive emphasis until the process of changing to a common unit value is comprehended.

Subtraction may then be taken up in the same order as given in addition.

The subtraction of the numbers representing the unit of measure will be easily connected with the same operation,—subtraction—in the simple and compound rules.

Multiplication and Division of Fractions—The correlative phases of the same measuring process should be observed in performing the operations of multiplication, and division of fractions.

These operations present greater difficulty to the pupil, than addition and subtraction of fractions, as they involve a two-fold ratio expressed by the numbers which measure the derived unit, multiplicand and the times of repetition in the implied measurement.

The object of multiplication is to bring out explicitly the number of primary units that measure an implied measurement expressed in terms of a derived unit as ($\$\frac{3}{5} \times \frac{1}{2}$) implied measurement = by multiplication $\frac{1}{5}$ which applied to the prime unit = $\$\frac{1}{10}$.

Steps in Operation

(*a*) $\frac{2}{3} \times 5$; (*b*) $6 \times \frac{2}{3}$; (*c*) $\frac{2}{3} \times \frac{4}{5}$; (*d*) $15\frac{3}{4} \times 2\frac{2}{3}$.

(*a*) Multiply $\frac{2}{3}$ by 5.

Operation.

i. $\frac{2}{3} \times 5 = \frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{10}{3} = 3\frac{1}{3}$.

Or,

ii. By diagram.

Explanation. — Since the new numerator will contain 10 units, 10 divisions are required.

Let ABCD = unity, *i.e.*, it will contain 3 divisions.

Then A B K R = $\frac{1}{3}$ of a unit and A B F H will contain $\frac{2}{3}$ of a unit. Also ABMN = 5 × 2 times $\frac{1}{3}$ = 10 times $\frac{1}{3}$ or $\frac{10}{3}$.

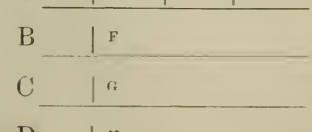
Or,

iii. $\frac{2}{3} \times 5 = 5$ times $\frac{2}{\text{units}} = \frac{5 \times 2}{\text{units}}$; $\frac{5 \times 2}{\text{units}} = \frac{10}{\text{units}} = \frac{10}{3} = 3\frac{1}{3}$;

Explanation. — Repeat 5 times, the (2) in the derived unit $\frac{2}{3}$ ft.* Then define the quantity by substituting the unit $\frac{1}{3}$.

*Note—$\frac{2}{3}$ ft. is considered a derived unit when it is to be repeated. There is also a derived sub-unit $\frac{1}{3}$ ft. used in defining the derived quantity $\frac{2}{3}$ ft.

To show that $\frac{3}{4}$ of any quantity = $\frac{1}{4}$ of 3 times the quantity.



Let A be any quantity measured in terms of the unit $\frac{1}{4}$. A then equals $\frac{4}{4}$. Let B, C, D, be each measured quantities equal to A. Take BF, CG, DH = $\frac{1}{4}$

of each. Now we see as a necessary truth that AK $=BF+CG+DH$.

$=\frac{1}{4}$ of each of the 3 equals B, C and D.

$=\frac{1}{4}$ of 3 times A.

$\therefore \frac{3}{4}$ of $1=\frac{1}{4}$ of 3.

Show $\frac{3}{4}$ of $1=\frac{1}{4}$ of 3 by using numbers.

$\frac{3}{4}$ of $1=\frac{1}{4}$ of 3. Now $\frac{1}{4}$ of $3=\frac{1}{4}$ of $\frac{1}{4}$

$\frac{1}{4}$ of $\frac{1}{4}=\frac{3}{4}=\frac{3}{4}$ of 1. $\therefore \frac{1}{4}$ of $3=\frac{3}{4}$ of 1.

(*b*) Multiply 6 by $\frac{2}{3}$.

Operation.

$6\times\frac{2}{3}=6\times 2\ (\frac{1}{\text{third}})$

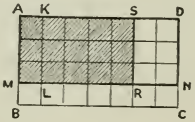
$=\frac{6\times 2}{3}=4$

Explanation.--Since we operate with the pure numbers representing measured quantity, we can commute these factors, and hence obtain the result $\frac{6\times 2}{3}=4$.

(*c*) Multiply $\frac{5}{7}$ by $\frac{3}{4}$.

Operation.

i. By diagram



Explanation. —— Draw A D and divide it into 7 equal parts. Draw AB at right angles to AD, and equal to four of the equal parts. Complete rectangle ABCD. Through each point of division draw lines parallel. Then ABCD = unity; AMND $=\frac{3}{4}$ of ABCD; AMLK $=\frac{1}{7}$ AMND and AMRS $=\frac{5}{7}$ of AMND $=\frac{5}{7}$ of $\frac{3}{4}$. Then AMRS is the required figure. But AMRS contains 15 squares and ABCD contains 28 squares. $\therefore$ AMRS $=\frac{15}{28}$ of the whole $\therefore \frac{5}{7}$ of $\frac{3}{4}=\frac{15}{28}$.

Or,

ii. Using pure numbers, multiply $\frac{5}{7}$ by $\frac{3}{4}$.

Operation.

$\frac{5}{7} \times 3 = \frac{15}{7}$

$\frac{5 \times 3}{7 \times 4} = \frac{15}{28}$

$\therefore \frac{5}{7} \times \frac{3}{4} = \frac{15}{28}$

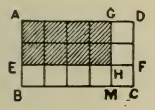
Explanation.—$\frac{5}{7} \times 3 = \frac{15}{7}$ is 4 times too great so we take $\frac{1}{4}$ of this

Hence $\frac{5}{7} \times \frac{3}{4} = \frac{5 \times 3}{7 \times 4} = \frac{15}{28}$.

To multiply $\frac{5}{7}$ by $\frac{3}{4}$ we must do to $\frac{5}{7}$ what is done to unity to get $\frac{3}{4}$. We must divide $\frac{5}{7}$ into 4 equal parts and take 3 of these parts. Each part will be $\frac{5}{7 \times 4}$ and 3 of these $= \frac{5 \times 3}{7 \times 4}$

Hence the rule :—$\frac{\text{Product of numerators.}}{\text{Product of denominators.}}$

To illustrate the "Law of Commutation" by showing $\frac{2}{3}$ of $\frac{4}{5} = \frac{4}{5}$ of $\frac{2}{3}$.



I. A B C D = unit; A E F D = $\frac{2}{3}$ unit and AEHG = $\frac{4}{5}$ of AEFD = $\frac{4}{5}$ of $\frac{2}{3}$ of ABCD = $\frac{8}{15}$ of unit.

II. Again same unit ABMG = $\frac{4}{5}$ of unit, and AEHG = $\frac{2}{3}$ of ABMG = $\frac{2}{3}$ of $\frac{4}{5}$ of ABCD = $\frac{8}{15}$ of unit.

The truth is direct.

(*d*) Multiply $15\frac{3}{4}$ by $2\frac{2}{3}$.

Operation.

$15\frac{3}{4} \times 2\frac{2}{3} = (15 + \frac{3}{4}) \times (2 + \frac{2}{3})$;

$= 30 + \frac{6}{4} + 10 + \frac{1}{2} = 40 + \frac{5}{4} = 42$;

Explanation.—Separate both numbers into prime and derived units and multiply first by the prime unit 2 and then by the derived unit $\frac{2}{3}$. Adding the result we get 42.

Do not allow pupils to reduce at all times to mixed numbers.

To prove $\frac{3}{4} \times \frac{5}{7} = \frac{3 \times 5}{4 \times 7}$

(a) $\frac{3}{4} \times 4 = 3$, since $\frac{3}{4} \times 4 = 3 \times \frac{1}{4} \times 4$;

(b) $\frac{5}{7} \times 7 = 5$, since $\frac{5}{7} \times 7 = 5 \times \frac{1}{7} \times 7$.

Multiplying (a) and (b), $\therefore (\frac{3}{4} \times 4)(\frac{5}{7} \times 7) = 3 \times 5$.

Divide through by 4×7.

$$\therefore \frac{3}{4} \times \frac{5}{7} = \frac{3 \times 5}{4 \times 7}$$

Generally

Let $\frac{3}{4}$ = factor A and $\frac{5}{7}$ = factor B.

$\therefore 3 = 4$ A; $5 = 7$ B.

Multiplying $3 \times 5 = 4 \times 7 \times A \times B$.

$$\therefore AB = \frac{3 \times 5}{4 \times 7};$$

But AB is the product of $\frac{3}{4} \times \frac{5}{7}$

$$\therefore \frac{3}{4} \times \frac{5}{7} = \frac{3 \times 5}{4 \times 7}$$

Generally $\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$

Division—When we measure a derived quantity by a derived unit whose measure is prime to the measure of the derived quantity, we obtain a number which is fractional.

By division we operate with these numbers representing the measure of the unit and the whole measured quantity and obtain a number which expresses the ratio of the whole quantity to the unit of measure.

Example.—$1\frac{3}{4}$ feet measured by $\frac{7}{8}$ feet. Reducing we have 14 eighths by 7 eighths = 14 units by 7 units. By division $14 \div 7 = 2$ the ratio.

The operation of division may also render implied an explicit measurement thus reversing multiplication.

Steps in Division

Measurement.	Indicated Operation.
(*a*) 2 ft. ~ed by $\frac{2}{3}$ ft unit.	$2 \div \frac{2}{3}$
(*b*) $\frac{3}{4}$ ft. ~ed by 2 ft. unit.	$\frac{3}{4} \div 2$
(*c*) $\frac{3}{4}$ ft. ~ed by $\frac{2}{3}$ ft. unit.	$\frac{3}{4} \div \frac{2}{3}$
(*d*) $5\frac{1}{4}$ ft. ~ed by $3\frac{1}{2}$ ft. unit.	$5\frac{1}{4} \div 3\frac{1}{2}$

(~ed equals measured).

The quotients from above, being pure numbers, may be used as the divisors of the measures of the dividend quantities, and the quotients resulting will be the numbers defining the derived units of measure.

(*a*) 2 ft ~ed by $\frac{2}{3}$ ft unit.

Operation.

$2 \div \frac{2}{3} = \frac{6}{3} \div \frac{2}{3}$

6 thirds $\div$ 2 thirds = 6 units $\div$ 2 units;

6 units $\div$ 2 units = 3 $\therefore$ $2 \div \frac{2}{3} = 3$

Explanation. —If we wish to find the ratio of $\frac{2}{3}$ feet to 2 feet we operate with the numbers by dividing the measure of the whole quantity by the measure of the unit.

(*b*) $\frac{2}{3}$ ft. ~ed by 2 ft. unit.

Operation.

$\frac{2}{3} \div 2 = \frac{2}{3} \div \frac{6}{3}$

2 thirds $\div$ 6 thirds = 2 units $\div$ 6 units;

2 units $\div$ 6 units = $\frac{2}{6} = \frac{1}{3}$.

Explanation. —In place of the act of measuring we mentally perform the operation of division by dividing the measures as shown in the operation.

(*c*) $\frac{3}{4}$ ft. ed by $\frac{2}{3}$ ft. unit.

Operation.

$\frac{3}{4} \div \frac{2}{3} = \frac{9}{12} \div \frac{8}{12}$,
9 twelfths $\div$ 8 twelfths = 9 units $\div$ 8 units;
9 units $\div$ 8 units = $\frac{9}{8} = 1\frac{1}{8}$.

Explanation.—This act of measurement can be mentally performed by operating with the numbers that value the derived quantities. This operation is division.

(*d*) $5\frac{1}{4}$ ft. ed by $3\frac{1}{2}$ ft. unit.

Operation.

$5\frac{1}{4} \div 3\frac{1}{2} = \frac{21}{4} \div \frac{14}{4}$
21 fourths $\div$ 14 fourths = 21 units $\div$ 14 units;
21 units $\div$ 14 units = $\frac{21}{14} = 1\frac{1}{2}$.

Explanation.—We can perform the measurement of $5\frac{1}{4}$ feet with the unit $3\frac{1}{2}$ feet by operating with the numbers that value the derived quantities. The operation is called division.

Analyze the following:

(*a*) $2 \div \frac{2}{3}$; (*b*) $\frac{3}{4} \div 2$; (*c*) $\frac{3}{4} \div \frac{2}{3}$; (*d*) $5\frac{1}{4} \div 3\frac{1}{2}$;

Example (*a*).

$2 \div \frac{2}{3}$ Explanation.—$\frac{1}{3}$ is contained in 1, 3 times in 2, 2×3 times; this is twice too great as we wish groups of 2 thirds.

$$\text{Result} = \frac{2 \times 3}{2}$$

Example (*b*) $\frac{3}{4} \div 2$. Explanation.—3 divided by $2 = \frac{3}{2}$ but this is 4 times too great since we had to divide not 3 by 2 but $\frac{3}{4}$ by 2.

$$\text{Result} = \frac{3}{4 \times 2.}$$ Since $\frac{3}{4}$ of $1 = \frac{1}{4}$ of 3.

Example (*c*) $\frac{3}{4} \div \frac{2}{3}$. Explanation.—$\frac{1}{3}$ is contained in 1, 3 times; in $\frac{3}{4}$ it is contained $\frac{3}{4}$ of $3 = \frac{3 \times 3}{4}$; but we wish groups of 2 thirds. Result $= \frac{3 \times 3}{4 \times 2}$

Example (*d*) $5\frac{1}{4} \div 3\frac{1}{2}$. Explanation.—$5\frac{1}{4} \div 3\frac{1}{2} = \frac{21}{4} \div \frac{7}{2}$. Now in 1 we have $\frac{1}{2}$, 2 times, in $\frac{21}{4}$ we have $\frac{21 \times 2}{4}$; but we wish groups of 7 halves.

Result $= \frac{21 \times 2}{4 \times 7}$.

The above may also be treated as the following examples.

Divide $\frac{3}{4}$ by $\frac{5}{7}$. This means $\frac{1}{7}$ part of 5, since $\frac{5}{7}$ of $1 = \frac{1}{7}$ of 5. Dividing by 5 we have $\frac{3}{4 \times 5}$ which we see must be set right by multiplying by 7 since we should have divided by $\frac{1}{7}$ part of 5. Result $= \frac{3 \times 7}{4 \times 5}$.

Again: Divide $\frac{3}{4}$ by $\frac{5}{7}$. Reduce to the same unit value, *i.e.*, to the greatest common unit value. Then we have $\frac{3 \times 7}{4 \times 7} \div \frac{4 \times 5}{4 \times 7} = \frac{3 \times 7}{28} \div \frac{4 \times 5}{28}$.

$= 3 \times 7$ twenty-eights $\div$ 4×5 twenty-eights.

$= 3 \times 7$ units $\div 4 \times 5$ units.

$= 4 \times 5$) $3 \times 7 =$ ($\frac{3 \times 7}{4 \times 5}$

To divide $\frac{3}{4}$ by $\frac{5}{7}$ is to find how many times $\frac{5}{7}$ is contained in $\frac{3}{4}$. Reduce to the same unit value, $\frac{3}{4} = \frac{21}{28}$; $\frac{5}{7} = \frac{20}{28}$;

$$\frac{21}{28} \div \frac{20}{28} = \frac{21}{20} = 1\frac{1}{20}.$$

Divide $\frac{5}{7}$ by $\frac{3}{4}$. This means to find what fraction multiplied by $\frac{3}{4}$ will give $\frac{5}{7}$.

Take the known $= 6 \mid \underline{18}$; ∴, 6 times Q $= 18$; ∴, Q $= 3$.
$\quad\quad\quad

that the value of a digit depends on its unit and that this unit is known by the position of the digit.

The pupil's idea of sub-unit acquired through the measurements expressed by fractions will now be combined with his knowledge of notation and also extended. The notation is an extension of the ten ratio system, and hence the position indicates the name of the sub-unit. Notation should now be explicitly brought before the pupils. It should be noted that every digit in the unit's place retains its intrinsic value while every digit to the left of the unit's place acquires a local value according to its position. The units have their local position and the number gives the measure expressed by the particular unit. The ten times increase as the digit moves to the left must be noted. Bring out that the value of every digit in a system of decimal fractions becomes ten times less or $\frac{1}{10}$ as great as it moves to the right.

By reduction of fractions the pupil will be able to express fractional quantities in terms of the sub-units $\frac{1}{10}$, $\frac{1}{100}$, etc. The metre and Canadian coins may be used as units in deriving quantity. These measurements can be expressed as fractions in terms of the above units. This new mode of expressing these measurements will be easy and natural if the notation is analyzed and made explicit. The pupils should have considerable practice in writing fractions in terms of the units $\frac{1}{10}$, $\frac{1}{100}$, etc., before using the decimal system in expressing them.

With the following expressions the pupil is quite familiar: $111 + \frac{1}{10} + \frac{1}{100} + \frac{1}{1000}$.

The increase and decrease by the ratio ten,

should be pointed out. The above equals $100+10+1+\frac{1}{10}+\frac{1}{100}+\frac{1}{1000}$.

Introduce the decimal point to separate the whole units from the sub-units and locate tenths, hundredths, thousandths in their respective positions. Then we have 100+10+1. 111.

i.e. $100=1\times100$ $\quad .1=1\times\frac{1}{10}=\frac{1}{10}$

$10=1\times10$ $\quad .01=1\times\frac{1}{100}=\frac{1}{100}$

$1=1\times1$ $\quad .001=1\times\frac{1}{1000}=\frac{1}{1000}$

Now give names to the parts—integral and decimal. A decimal will be seen as one whose unexpressed denominator is ten or a power of ten. This unexpressed denominator is the new element to be attended to and recognized.

It will be seen that this notation may be extended to millionths, etc., as before it was extended to millions, etc., a natural extension consistent with the already familiar notation.

Reading and Writing Decimals—Since decimals are fractions expressed in this new form, considerable practice should be given in reading and writing decimals in order that the pupil's knowledge of notation and fractions may be carried into this new but related part of the subject.

Drill on the relative position. Note that the number defining each unit must have its last digit placed in the position of that unit.

Twenty-five units = 25; Twenty-five hundreds = 2500
Twenty-five tens = 250; Twenty-five tenths = 2.5
Two hundred and twenty-five hundredths = 2.25
Two thousand two hundred and twenty-five thousandths = 2.225.

The first position to the right for tenths.
The second " " " hundredths.
The third " " " thousandths.

Dictate the number first as 2225, then when the unit is named the point indicates the absolute value.

Never allow pupils to say "decimal one five" etc. Read 15 one hundredths. Naming the unit decides the position of the point.

Drill on reducing units to tenths, to hundredths, to thousandths; hundredths to tenths, and thousandths to hundredths and tenths, etc., until the pupil can readily reduce up or down.

Bring out that $.5 = .50 = .500$; *i.e.*, that adding ciphers to the right of the decimal does not alter the value and that the unit value changes, decreasing by the $\frac{1}{10}$ ratio, and that the number defining the unit necessarily increases ten-fold.

Special attention should be given to the expression of decimal numbers in the hundredth's unit, thus preparing the way for percentage. Give plenty of exercise in reading and writing decimals. Vary the exercises until all forms and expressions become significant.

Addition and Subtraction—Very little new will arise in the above operations. Compare with the simple rules. Emphasize that we can only aggregate, or compare aggregates by adding or subtracting the numbers that define measurements in terms of the same unit. These two operations will be easily understood.

Multiplication—Multiplication indicates a stage of measurement. The unit—the multiplicand—and the number—multiplier—indicate a measurement.

By multiplying these numbers we find the value of the measured quantity in terms of the prime unit from which the multiplicand is derived. We operate with the numbers to define the measurement. Pupils will gain very little power by multiplying "decimals by decimals." They should refer the numbers to the quantities measured in terms of the decimals then "multiplying decimals" will have some meaning.

Steps in Teaching Multiplication—(1) Multiplication by 10, 100, etc.; (2) a decimal by a whole number; (3) a whole number and a decimal by a whole number; (4) a decimal by a decimal.

Give drill in multiplication by (10) ten. Begin with whole numbers. Educe that multiplying by 10, 100, etc., removes the digit one place, two places, etc., to the left of the point and dividing by 10, 100, etc., removes the digits one, two, etc., places to the right of the point.

Two methods of multiplication may be used.

First Method. Multiply .3 by .7

reduce to fractions $= \frac{3}{10} \times \frac{7}{10} = \frac{21}{100}$

written in decimal form $= .21$.

Second Method. Multiply .3 by .7.

since $3 \times 7 = 21$

$.3 \times 7 = 21$ tenths $= 2.1$

but .3 should have been multiplied by 7 tenths, the answer is ten times too great. Hence $\frac{1}{10}$ of $2.1 = .21$.

This second method assumes that pupils are familiar with the "ten ratio." It affords excellent training in comparison owing to the change in unit. The other steps can be similarly illustrated.

The pupils should for the sake of facility discover a rule for themselves and apply it in practice.

Division of Decimals—If the pupil has learnt the tenfold increase or decrease in multiplying or dividing by ten and the corresponding change of decimal point, he will have little difficulty in undoing the work of multiplication.

Mistakes are more frequently made in division than in any other part of the work. Pupils seem to have difficulty in placing the decimal point in the quotient. There are two reasons for this. The pupil may not understand the measuring process giving rise to division, or he may overlook the relation of the units.

Example I. Divide .6 by .2.

It seems impossible to divide 6 tenths into 2 tenths equal parts, but it is quite legitimate to measure 6 tenths by the unit of measure 2 tenths. We get as a number 3 which defines the ratio of 2 tenths to 6 tenths. This is what we mean by division at this stage.

Example II. Divide .6 by 2.

Here we wish to find what unit taken as a measurer to measure 6 tenths will give the number 2. We separate 6 tenths into two parts and find the unit of measure 3 tenths = .3.

The first measurement suggests the idea of changing to the same unit value; the second suggests reducing the divisor to a whole number.

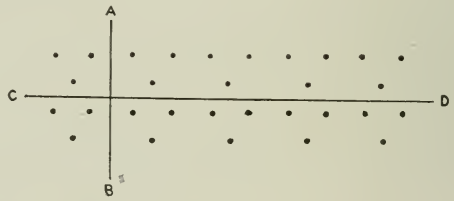
We have therefore two methods of teaching division, (1) by reducing to the same unit value, (2) by changing the divisor to a whole number.

Changing to the same unit value which emphasizes

the comparing of units, has been before the pupil in the simple and compound rules and fractions. This method is therefore a legitimate extension of what the pupil already knows. The other method depends on a truth or principle which ought to be placed before the pupils.

"If we increase the unit of measure and the quantity to be measured, in the same proportion the relation remains the same."

To give a perception of the related elements of number—unit—quantity in order to lead to a conception of the relation, place the necessary reality before the pupils.



First present the dots as above the line C D. Discover the relation. Then present dots as above and below C D. Discover the relation. The three dots above the line C D, and to the left of A B, represent the numerical value of any measured quantity to be used as a unit of measure; the twelve dots represent the numerical value of any measured quantity to be measured by the unit to the left of A B. Now double the dots in each case as above and below C D, then it will be seen that the relation remains unchanged.

Since this is a typical case, it holds good for all cases. This is not induction, as only one case is

necessary as far as seeing the truth is concerned. Hence we have the following rule of operation. If both divisor and dividend be multiplied by the same number the quotient is not changed.

Steps in division of Decimals—

(*a*) A whole number and a decimal, by a whole number.

(*b*) A decimal by a decimal.

(*c*) A decimal by a whole number.

First method :

Example I.—Divide 6. 4 by 5. Reduce both to tenths = 64 tenths, by 50 tenths. Now 64 tenths contain 50 tenths once and 14 tenths remain. This "one" is a whole number in the quotient.

Proceed now, multiplying each remainder by 10, and regulate the quotient accordingly. The quotient = 1.28.

Example II.—Divide 2.56 by .0032. Reduce both to ten-thousandths. We then have 25600 tenthousandths ÷ 32 tenthousandths, or 25600 ÷ 32 = 800.

Second method :

Example I.—Divide .64 by .5. Multiply both by ten, to make the divisor a whole number. We then have 6. 40 ÷ 5 = 1. 28.

Example II.—Divide 2.56 by .0032. Multiply by 10,000. We then have 25,600 ÷ 32 = 800.

Example III.—Divide .0032 by 1.6. Multiply by 10, to bring the divisor to a whole number. Thus we have .032 ÷ 16. Dividing we find no units in the quotient. Take down the 0 tenths we find no tenths in the quotient.

Take down the 3 hundredths; 16 will not divide 3, hence we have no hundredths; but 3 hundredths and 2 thousands make 32 thousandths. Now 16 divides 32 thousandths, giving 2 thousandths as quotient. Therefore the quotient = .002.

Relation of Decimals to Vulgar Fractions.—When the pupils have become familiar with decimal notation and can readily handle the four simple rules, they may consider the conversion of decimals into common fractions, and the conversion of common fractions into decimal form. The conversion of decimals into fractions will be apparent when the denominator is substituted, which in the reading is implied. .275 is read 275 thousandths = $\frac{275}{1000}$. Reduce to its lowest terms. No difficulty will be experienced in converting pure decimals into fractions if plenty of intelligent practice has been given in notation and numeration of decimals.

Converting fractions into decimals, however, requires more thought which, if properly directed, will lead to a classification of fractions into 3 kinds, as below; (1) those which give pure decimals; (2) those which give pure recurring decimals; (3) those which give mixed recurring decimals.

To reduce $\frac{7}{8}$ to a decimal.

$\frac{7}{8} = \frac{7}{2 \times 2 \times 2}$ Here we wish to get rid of 3 twos. Multiply by ten three times. Then we have

$$\frac{7x10x10x10}{2x2x2x10x10x10} = \frac{7x2x2x2x5x5x5}{2x2x2x10x10x10} = \frac{7x5x5x5}{10x10x10} = \frac{875}{1000} = .875$$

Now for every time there is two or five as a factor in the denominator, multiply both numerator and

denominator by ten, since 2 and 5 are the only prime factors of 10. But as tenths and hundredths hold a certain position in reference to the point, the denominator need not be written. Hence we see the reason for "add noughts and divide by the denominator."

Second method—Reduce $\frac{7}{8}$; $\frac{7}{8}$ of $1 = \frac{1}{8}$ of 7 has been already proven.

Lead to a conception of this truth by using dots.

8 | 7.000
.875

As 7 will not contain 8, reduce 7 units to tenths = 70 tenths; dividing 70 tenths into 8 parts we get 8 tenths and 6 tenths remaining = 60 hundredths; dividing sixty hundredths into 8 parts we get 7 hundredths and 4 hundredths remaining = 40 thousandths. Dividing by 8 we get 5 thousandths.

$\therefore \frac{7}{8} = .875$.

To reduce $\frac{2}{3}$ to a decimal.

By the first method we see that no number of multiplications by 10 would enable us to eliminate 3, since it is not a factor of 10; hence we conclude that $\frac{2}{3}$ cannot be converted into a decimal with a finite number of digits.

$\frac{2}{3} = .6666 = .\dot{6}$ a pure recurring decimal.

To reduce $\frac{3}{14}$ to a decimal $= \frac{3 \times 1}{7 \times 2}$

Here we have 2 as one factor of the denominator. Multiplying by 10 we get rid of 2. This will give 1 digit in the quotient that will not repeat. Since 7 is not a factor of 10 we have the divisor again giving an infinite number of digits.

$\therefore \frac{3}{14} = \frac{3 \times 1 \times 10}{7 \times 2 \times 10} = .2\dot{1}42857\dot{}$, a mixed recurring decimal.

We have the following classification of fractions as regards their relation to decimals.

1. Fractions, which in their lowest terms have in their denominators only the prime factors 2 or 5, give a finite decimal.

2. Fractions whose denominators contain neither 2 nor 5, give a pure recurring decimal.

3. Fractions which in their lowest terms have other factors in denominator as well as 2 or 5, will give mixed recurring decimals.

To convert a pure circulating decimal into a vulgar fraction:

Example—Change $.\dot{2}\dot{7}$ to a vulgar fraction, Multiply by 100. Pupils may discover the reason for using 100. Then $.\dot{2}\dot{7} \times 100 = 27.\dot{2}\dot{7} = 27 + .\dot{2}\dot{7}$. Take $.\dot{2}\dot{7}$ from each side and we get $.\dot{2}\dot{7} \times 99 = 27$. Divide each side by 99 we get $.\dot{2}\dot{7} = \frac{27}{99}$

To convert a mixed circulating decimal into a vulgar fraction.

Example—Change $.31\dot{4}$ into a vulgar fraction. Multiply by 1000.

(*a*) $.31\dot{4} \times 1000 = 314.\dot{4} = 314 + .\dot{4}$. Multiply by 100.

(*b*) $.31\dot{4} \times 100 = 31 + .\dot{4}$. Subtract (b) from (a); 900 times $.31\dot{4} = 283$. $.31\dot{4} = \frac{283}{900}$

Other methods of reducing decimals to vulgar fractions might also be given.

Percentage—Percentage should not be considered as a totally new phase of arithmetic. At most it is merely a special kind of measurement already developed in the treatment of fractions and decimals. The pupil has really no new stage of measurement with which to deal, but, on account of the nature of our

system of commercial transactions, it is found convenient to make calculations with 100 as a standard.

Steps in Teaching Percentage.—1. Show relation to fractions and decimals. $\frac{7}{100} = .07 = 7$ of the hundred parts of a unit. The business man calls this 7 per cent. (to be developed as follows):

2. Develop the term per cent. %. $\frac{5}{100}$ of 200: .05 of 200, now 5% of 200. This is seen to be the same as the fractional and decimal treatment.
3. The pupil knows how to change fractions to equal ones of different unit value. (Give practice in this).
4. Have fractions changed to hundredths, and establish that this is a convenient denominator on account of the special mode of measurement used in business.
5. Put stress on the different ways of writing hundredths. $\frac{7}{100} = .07 = 7\%$, a short way of stating the first two. Give examples using the three methods $\frac{7}{100}$ of 200, .07 of 200, 7% of 200. The pupil will now see that his fractions and decimals are changeable to hundredths and that 7% is a statement of the other two in another form.
6. Convert such fractions as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, etc., to hundredths. Now write them as decimals. Then use them with the name %. Establish this relation well.
7. Have pupils solve the same question all three ways, and point out that for rapidity and brevity we may select the one best suited to our purpose.

Example—Find ($\frac{1}{4} = \frac{25}{100} = .25 = 25\%$) of $648.

8. Give practice problems:

(*a*) How much is 2% of $200, of 200 feet, of 200 lbs., of 200, of 50, etc.

(*b*) 6% of certain quantities gives $36, 60 feet, 72 cents, $1000, etc. Find the quantities.

(*c*) $12 is what % of $24? of $60? etc.

(*d*) Increase certain sums by 5%, 10%, 20%, etc., of themselves. What % then have we?

(*e*) An increased sum is $104, 208, or 52 cents. If the increase was 4%, find the sum at first.

(*f*) Diminish $60, $80, etc., by 5%, 10%, etc., of themselves.

(*g*) A sum diminished by 5%, 10% is $190, $380, etc. Find the sum.

Vary the mode of solution.—Now give questions involving three relations.

Example:—A number diminished by 25% of itself is $60. Find the number when increased by 25%.

Establish that the relation of 60 to the required quantity is 75 to 125, or 3 to 5. Now if $60 is measured by 3 units, 5 units will be the measurer of $100.

Give plenty of practice in this until pupil can solve problems without too much analysis.

Particular Application of Percentage.—The pupil will now be familiar with the relation of percentage to decimals and fractions, and will be able to apply his knowledge of % to particular cases. The chief difficulty will be to understand the nature of the transactions and the language of the problems.

Do not attempt to educe the technical terms used.

Develop the nature of the transactions but instruct in the terms. Simple names as rent for interest,

price for commission, and lots for stock, may be used until the nature of the transaction is understood; then the technical terms should be given.

Give plenty of time, and vary the rates and amounts in the same transactions.

The special application of % will come under the following headings:

1. Profit and Loss.
2. Interest and Discount.
3. Commission.
4. Insurance.
5. Stock.
6. Taxes.
7. Duties.
8. Exchange.
9. Partnership.

Certain customs growing out of the "Law Merchant," such as "three days' grace," should be impressed. A note drawn January 31st for one month is by statute law due on the last day of February. The statute, however, recognizing the custom of the "Law Merchant" legalizes the "three days' grace," originally a custom, and hence the day of maturity of the note is March 3rd.

The teacher should carefully grade the exercises in each of the above cases, and should not depend too much on any text book.

CHAPTER IX.

DRAWING.

Introduction—Drawing is expressing knowledge by means of a picture. All children have the power to tell, and delight to tell what they know by means of a drawing. The teacher should give the child an opportunity to draw by putting suitable materials in his hands, and, possibly, by suggesting a suitable subject. The subject should interest him and therefore should be drawn from the child's environment. The skilful teacher can lead the child from simple and crude representations to observe the form, beauty and structure of things about him, and to express his observations by a drawing.

The child, as soon as he comes to school, should be made to feel that he has power to picture objects and is not dependent on the teacher for that power. The teacher's duty is to direct him, and by encouraging questions to lead him to discover how he may improve his representations. Too much must not be expected from a child. All children can be taught to draw, even if the attempts are at first crude. It must not be expected that all will draw equally well after the same amount of training. Such uniformity is not expected in other subjects, and should not be expected in drawing.

Expression by drawing is a union of the mind, the hand and the medium. If the idea in the mind is perfect, the hand, by practice, may be brought to the

same degree of perfection. Until recently it was thought that drawing was a trick of the hand, and therefore uninteresting exercises in line drawing formed the larger part of a course in drawing. Form without thought will not interest. Perfect the knowledge and give opportunities for expression by means of a drawing.

A course in drawing should be influenced largely by the locality, but generally it should include a study of the actual form of objects, their appearance and their beauty.

A study of the actual form of objects is the basis of the constructive arts. The form of anything to be constructed depends upon its *use*, and as several forms may possibly perform this function equally well, it will be desirable to select the most *beautiful* one.

The representation of the appearance of objects on a flat surface depends upon certain principles that can be learned only by observation of the object. A *story* may be told by a certain grouping of objects in a picture. Pictures of recognized value should be studied for the *story* they tell and for *how* it is told.

Objects may be made more pleasing by the application of *color*; by the arrangement of *decorative forms*, or by both; the study of how form was enhanced by the application of color and ornament in the past is highly instructive.

The teacher should seldom interpret form for the children, or in other words, draw pictures for them. The question then arises—can the teacher who cannot draw teach drawing? The teacher is the guide, and the children's source of inspiration, and unless he

knows the course he cannot fulfil his duty. A knowledge of the difficulties to be overcome, the pleasures to be enjoyed, and the results to be expected in a course of drawing cannot be obtained except by going over the course. Every teacher can learn enough of the subject by a little application, to teach it, but as in every other subject, the more one knows of it, and of the mental processes by which it is obtained, the better he is able to teach it.

The Value of the Type Forms—All primary teaching begins with a study of objects familiar to the child. He has observed by sight and touch many objects before coming to school. His knowledge of them is necessarily vague and indefinite in many particulars, as may be noticed by his expression of them in a drawing. To make his knowledge full, complete, and exact it is necessary that he should generalize and group the many objects that have come under his observation. If left to his own resources, he may be able to refer these many form-impressions to the standard types, but this is very improbable. At this age the child must be helped. The best way to help him is to place before him, along with several miscellaneous objects, the *type* that is the embodiment of all these miscellaneous objects.

Suppose that we place before the child a number of objects that may be referred to the *sphere* as their type, such as an orange, a tennis ball, a baseball, a marble, an apple, a plum, a peach, etc. He has seen these but he has very indefinitely noticed that they are closely related to each other in FORM. By reason of their different uses they stand apart and are

just so many isolated things. Place among them two or three spheres of different sizes. Allow him to handle and observe these objects. Ask him if they are of the same shape. Get him to select the "*roundest*" ones; the next "*roundest*" and the next, and so on. The child easily forms a sequence of forms from the most spherical to the least. He is no longer bewildered. The objects possess a new interest by reason of their relation to each other in form. He recalls many other forms that are similar in shape and he notes resemblances and differences. The type form of all is the SPHERE.

The SPHERE moves readily. It is difficult to get it to rest. It is lively, full of *life*. The child delights in objects that are full of *motion* or life. All games that are played with a ball call forth activity of body and mind. Nearly all fruits are spherical and under proper conditions exhibit signs of life. The sphere is the ideal or type of all things that have *unity*, *mobility* and *life*.

The child has seen blocks, bricks, boxes, houses and books. He has played with blocks and built them into playhouses. The teacher places these or similar objects along with the CUBE. He may have noticed their plane faces and straight edges, but until now their relations have not been noticed. The relation in form is now clear, and, as before, he recalls other similar objects for comparison. He learns under the guidance of the teacher that the cube is the type of *stability* or *rest*. He contrasts the cube and the sphere and the objects in each class, and he sees that they are *opposites* in *action* as well as appearance.

The child has observed barrels, pails, cups, bottles, stems of plants, and pillars. When the teacher shows him the type, the CYLINDER, he sees the relation as before. He compares the *cylinder* with the *cube* and the *sphere*, and he sees that it has *stability* like the cube and *mobility* like the sphere. It partakes of the characteristics of both, and consequently in a less degree than either.

The child when he sees that all objects may be referred to certain well defined types, begins to enquire *why* some objects are spherical, some cubical and some cylindrical; why some are more removed in form from the type than others. He gets a grasp of the great truth that the forms of both natural and artificial objects are largely determined by the work they are required to perform.

This study of objects by referring them to types gives clearer concepts than when studied in any other way. It follows that their expression by a drawing will be improved. The expression of the types by a drawing is the best means of training the child to see proportions, to judge of space-relations, and also the best means of teaching him the principles that underlie the representation of all objects, on a plane surface. In other words all the principles of drawing are exemplified when the types are drawn singly and in groups. Surely then it is not too much to expect that every person who intends to be a teacher will master the representation of the types.

There must be class teaching in drawing. Every member of the class should have the object under consideration, and should place it so that the

appearance will be approximately the same to each. One large model should be used for class instruction but not to draw from, as the appearance to each pupil would then be different. Supervision in such a case would exact too much of the teacher's time that might be spent more profitably in general instruction.

Materials—There is just now a difference of opinion regarding the medium that should be used for drawing in public schools. The pencil has been the medium for many years, and its use has been condemned by some because the results obtained have not been all that they desire. In its place, crayons, the brush, and pen and ink have been recommended. A change of medium has in some cases brought about better results than those produced by the pencil. Such improvement has been attributed to the medium when it should have been credited to the increased interest taken in the subject by the change, and the extra effort put forth by the teacher to make the work a success. The quality of the drawing does not depend so much upon the medium as upon the method of instruction. For cheapness, simplicity and results, no other medium in the lower classes is equal to the lead pencil. In the higher classes the use of pen and ink and the brush may be taught for the purpose of giving all an insight into the method of using other mediums. The best grade of pencil is an HB of any reliable make. Pencils used for drawing should not be used for anything else. The only sharpening necessary in the lower classes is to cut away the wood leaving about $\frac{1}{8}$ of an inch of the lead exposed.

This will insure a broad line. The lead should never be put in mouth as wetting injures it.

Paper—Any paper with a medium rough surface will be suitable. First and second classes should always use a common scribbling book in which to make their first drawings. After the best form possible is obtained the drawing may be recorded in a special drawing book.

Erasers—Pupils of the first and second classes should not be allowed to use an eraser. Its use may be taught in the higher classes with some expectation that it will be used as directed. The eraser is to be used to rub out the construction lines and the light trial lines employed to get the perfect outline. As the child learns to see and express proportions, these trial lines will become fewer, and if drawn lightly, may not be erased as they will form part of the finished drawing. The eraser should be soft and wear away itself without destroying the surface of the paper. The secret of neat erasing is the use of light lines.

Pen and Ink—After the proportions of an object or group are obtained by the pencil, the drawing may be accentuated with a pen and ink. Any pen used for ordinary writing may be used. India ink in the liquid form gives the best results.

Brushes—A brush about the size of a lead pencil and tapering to a point so that a fine line may be drawn with it is the best,when only one is used. Sepia or India ink should be used for the first drawings.

For color work, water colors in soft cakes are the best for beginners.

Position of Pupil, Book and Pencil—The book or surface on which the drawing is made should be

nearly vertical with the top slightly inclining away. It should be placed so that the object and its picture may be compared with as slight a change in the line of direction as possible. If this position be maintained from the beginning the child will have a much better understanding of what is meant by picture plane than if the drawing surface is placed upon the top of the desk and the explanation of its true position given. This position aids free movement of the hand and arm, so necessary in *freehand* drawing. A small drawing board, or, in its absence, a large slate, may be used on which to place the book when drawing.

Pupil—The pupil should sit well back in the seat so that the arm may have a free movement from the shoulder. This is particularly necessary for young pupils who have not yet acquired the control of smaller movements of the fingers. Exercises on common forms that have been drawn should be given frequently to practise this free arm movement. Drawing on the blackboard will aid in securing freedom. The drawings of young children should be much larger than those of older ones, because of their having more control over larger movements of the arm than over smaller ones.

Pencil—The pencil should be long and held between the thumb and first two fingers about three inches from the sharpened end. When the first light sketch is made to the satisfaction of the child and teacher, the pencil may be held nearer the point for the purpose of finishing or accenting the drawing.

The Principles of Representation—Children should be given every opportunity to express their

thoughts by a drawing. Such exercises should be used constantly, and the drawings supervised by the teacher, who should suggest improvements and the application of principles learned from the teaching of the types. This part of the teaching is often neglected. Many teachers imagine that all that is necessary is to learn to draw the type solids and a few objects similar to them, singly, and in groups. The drawing of the types and similar objects is valuable as a means of teaching certain well-defined principles but it falls far short of what the aim of the teaching should be. The principles of teaching drawing may be explained in a manual, but only a general idea can be given of the application of drawing to the other subjects. This application depends upon the individuality of the teacher and the opportunity given the pupils. There is no better exercise for seat work than illustrating by drawings some previous lesson in literature, geography, or nature study. This must be done if the pupils are to maintain that naturalness of expression which is so often lost by teaching the drawing of the types only.

The Sphere—Each pupil has a sphere resting on a stand, the top of which is about as high as his chin and at a distance of about an arm's length. A book will answer the purpose and may be raised to a proper height by some such device as shown in Fig. 1. The sphere (a rubber ball will answer the purpose) may be kept in position by a ring or three small sticks.

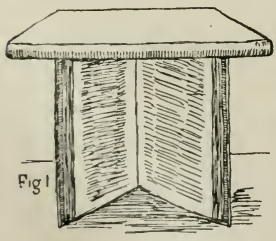


Fig 1

Each pupil looks at his sphere and draws its appearance, about the size indicated by the teacher. The teacher passes around the class, giving suggestions and encouraging the pupils to make free movements. He encourages them to compare the picture with the object and to make corrections.

The teacher calls for volunteers to draw the sphere on the blackboard from memory. Others are asked to suggest improvements and to make them until the final drawing is as well done as can be expected from the class. Each pupil feels that he is interested in the picture and will try to correct his own drawing. Each pupil is then asked to draw the *back edge* of the book in its *apparent* position in relation to the sphere. Many will not have it properly placed as this is the first lesson in locating lines in their apparent relation to each other. To get them to see this relation the teacher questions somewhat as follows:—Can the whole of the back edge be seen at once? What hides the part you cannot see? Do you show anything in a picture you cannot see? How high on the sphere does the back edge appear? Touch the sphere as high up as the edge appears. Corrections are then made, and one pupil draws the edge upon the blackboard. The apparent position of the front edge is located in a similar way (Fig. 2).

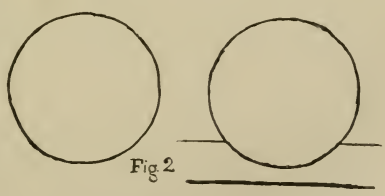


Fig 2

All corrections should be made by getting the pupils *to see* the apparent position of the object, not by *showing* him this position.

To get the pupil to observe correctly, the teacher points to a line in the picture, and the pupils point to what it represents in the object, and *vice versa.* Pupils should not only be able to point out what each line in a picture represents, but to *tell* what each line represents. They should be taught as early as possible that a line, in outline drawing, represents *an edge or their limit of vision on a curved face.* When the pupils are taught in this way to draw what they see they will not make diagrammatic pictures.

Objects like the sphere may now be drawn, but before drawing any object its characteristics should be taught, and then these characteristics will be shown in the drawing. Common objects that may be studied are a base ball, a foot ball, a tennis ball, an orange, an apple, a plum, a peach, a pear, a pumpkin, a melon, a tomato, an onion, etc.

When pupils can write, a description in words should accompany the picture. Such an exercise is valuable for seat-work.

To get pupils into the habit of observing everything, they should be asked to look for examples of the use of the sphere in ornament and in the construction of objects.

Pictures of objects resembling the sphere may be collected and pasted in the drawing book, or kept for reference in some other way.

The drawing lesson may be varied by teaching the use of terms such as up, down, right, left, front, back, above, under, middle, vertical, horizontal, oblique, parallel, etc.

The Cylinder—Each pupil places the cylinder in

a vertical position, so that the top is slightly below the eye-level. (In the absence of a wooden model a tin can will answer every purpose). If the pupils have observed correctly, the drawing will resemble Fig. 3. It is rarely that pupils in the first class will make a drawing very accurate, nor must it be expected. If the teacher insists on correct drawings it tends to make the drawings diagrammatic. If the pupils show by their drawings that they are trying, improvement will be the result.

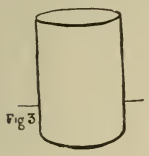
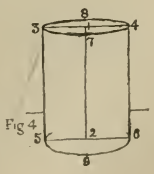


Fig 3

In the first and second classes if three things are observed it will be sufficient: (1) That the top appears as an ellipse, (2) That the curve of the bottom is greater than the curve of the nearest half of the top, (3) That the lines that represent the limit of vision of the curved face are vertical. The first may be taught by moving the cylinder up to the eye level and down; the second may be deduced from the first, but more easily by tracing the shape of the bottom on a piece of paper and moving the cylinder to the right of the tracing, and comparing the apparent vertical width of the tracing, and the top of the cylinder.

When pupils reach the third class, guide lines may be used to get accurate drawings of the cylinder. The method of teaching would then be something like the following:— Draw a line to represent the apparent length of the cylinder, as 1-2, (Fig. 4). (The apparent length from top to bottom will differ but slightly from



the apparent length of the axis and so may be taken to represent the length of the axis). Through each end of this line draw a line to represent the greatest apparent width of the cylinder, as 3–4, and 5–6. These lines must bear the same proportion to the first line drawn as the apparent width of the cylinder bears to its apparent length. Find the apparent vertical width of the top face. This may be found by placing the pencil in a vertical position against the curved face at its nearest part, and moving it till the top of the pencil appears as high as the farthest point of the top. Locate the nearest and farthest point on the top as 7 and 8. Locate the apparently lowest point as 9, by finding how much lower this point appears than 5 and 6, the farthest points visible on the bottom edge. Complete the figure by drawing the vertical lines 3–5, and 4–6.

A valuable exercise in reasoning is getting the pupils to locate the farthest point on the bottom of the cylinder. This point is invisible but it may be located, since the actual shape of the base is known. Such exercises are valuable as they lead the pupil to imagine the appearance of any object in a position in which it has not been observed, provided its appearance has been perceived in two or three other positions.

The drawing may now be finished by erasing the guide lines and any other lines not required, and then accenting the outline as shown in the finished drawing (Fig. 3).

The vertical cylinder may now be drawn in other positions, and objects similar to it in shape.

The cylinder may be placed in a horizontal position, with its axis at right angles, parallel, and at any other angle to the line of direction. The method of locating the apparent position of the principal points is similar to the last position and does not require lengthy explanation. See Fig. 5.

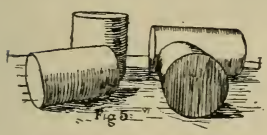


Fig. 5.

Pupils may collect pictures showing the cylinder, and may describe places where it is found in ornament and in architecture.

Many useful conversational lessons may be taken up with the drawing lessons on terms such as surface, face, curved face, plane face, circle, circumference, diameter, radius, edge, curved edge and axis.

The Cube—Each pupil places the cube on a book so that one vertical face is visible. Pupils draw the appearance of this face which is a square. When drawing a square the lines should be drawn in the order shown in Fig. 6.

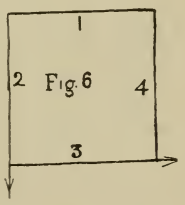


Fig. 6

Lower the surface on which the cube rests so that the top face of the cube is slightly below the eye level. Each pupil draws the appearance of the front face. The far edge of the top face is located and a line drawn to show its position, Fig. 7. Its apparent length as compared with the front edge, is found. To do this hold two pencils vertically against the front face and move them, still keeping them vertical, till

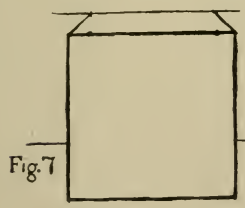


Fig. 7

the ends of the back edge appear to touch the pencil. Notice where the pencils touch the front edge, and mark these points. The back corners appear vertically above these points. When the corners are located the receding edges may be drawn and the drawing finished as in the case of the cylinder. Require the pupils to locate the position of the invisible edges. A good exercise is to let several pupils draw the cube on the blackboard, each drawing a line to represent an edge when pointed out on the cube by the teacher.

Many exercises may be given on objects like the cube. For first and second classes two faces only should be shown. Objects drawn similarly to the cube are—a box, a book, a table, a brick, a chair, etc.

The Cube in other Positions—Pupils in the third class may be asked to draw the cube and other objects in more difficult positions. Place two cubes below the eye-level, one slightly to the right and the other slightly to the left, so that the front and top faces, and also the inner faces of each are visible.

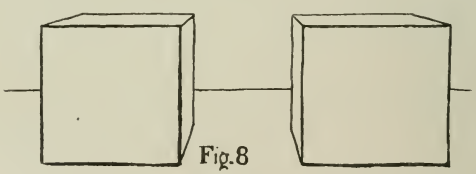


Fig. 8

(Fig. 8). The appearance of the two may be shown similarly as when only two faces were visible.

Teach the term horizon and how it is represented in a picture. A horizontal line at the eye level is a picture of the horizon. Require pupils to observe the appearance of long receding parallel edges as fences

by the roadside, railway tracks, etc. Teach that horizontal receding parallel edges appear to meet on the horizon and therefore in the picture will meet at the eye level. To prove the correctness of observation, a line to represent the eye level may be drawn and the receding lines of the cube produced. If the lines representing parallel receding edges be produced in the picture, and if they meet at the line that represents the eye level, the drawing is accurately made. It is not expected that a freehand drawing from observation will stand this mechanical test, but it is well to know how to prove the correctness of a drawing which should always be approximately correct.

The Cube Turned—Place a cube below the eye level with the two visible vertical faces equally turned away. The pupils observe its appearance and select some edge as the unit of measurement. The nearest vertical edge is the best in this case. Draw a line to represent this edge as 1–2 (Fig. 9.) Compare the distance of the other two vertical edges from the nearest edge. If the cube is properly placed these edges will appear to be at the same distance from the nearest edge. Draw lines in proper position to represent the position of these edges, as 3–4, and 5–6. Draw the lines much longer than necessary. Locate the corners at the base of the last lines drawn. To aid in their location hold the pencil horizontally against the nearest vertical edge and move it till those corners are just visible below it. Notice the relative position of the lower part of the pencil on

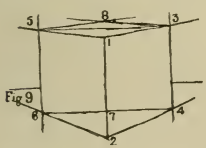


Fig. 9

the vertical edge. Mark this point in the picture as 7. Draw a horizontal line to represent the apparently lowest part of the pencil, and where this line cuts the other vertical edges there will be the position of the corners as 4 and 6. Locate the upper corners in a similar manner. Find the apparent height of the far corner 8 above the near corner 1 at the top. Locate 8. When the corners are located it is quite an easy matter to draw the edges. Erase the guide lines and accentuate the drawing.

The cube in this position may be drawn by observing the apparent slant of the edges from the line 1–2, and drawing lines at this slant. To aid in judging this slant, a jointed ruler may be used, one leg being held vertically against the nearest edge, and the other moved to just cover one of the receding edges.

Test the correctness of your drawing by producing the converging lines.

Turn the cube at various angles and compare the effects. The most pleasing effect is obtained when there is a slight inequality in the apparent width of the vertical faces. To draw the cube in this position proceed as in the last position. As the pairs of corners are apparently of unequal height, each will have to be located separately.

Grouping—Pupils should begin to draw objects in a group as soon as they have drawn them singly. Two apples, then three, in a group will be a simple beginning. The selection of objects and their arrangement in a group will depend upon the idea intended to be expressed. To draw a group, first block in the whole, then locate the apparent

position of the top and bottom of each individual of the group. Never complete the drawing of a single member of the group before another is commenced, carry the drawing of the whole along simultaneously. The leading idea suggested by the group will then not be subordinated to the individual object. When grouping choose the principal object and place it near the centre of the group. Place the other objects about it so that if the bases of the individual objects were joined, an irregular figure would result. The objects should appear at rest and their apparent heights should not be in a straight line. Some of the objects should be partly hidden by the others.

Shade and Shadow—When a pupil can see a shadow of an object and that one part of an object appears darker than another part of it because the light does not fall upon it directly, he should be allowed to express the shade and shadow. Express shades or shadows on plane faces by straight parallel lines, and on curved faces by curved lines. On vertical faces use vertical lines, and on horizontal faces use horizontal lines. The position and kind of the surface can thus be suggested at the same time as shade and shadow.

Color—Color should be taught in every school. Children should be taught to recognize the standard colors, their tints and shades. The method of teaching may be obtained from any manual on color.

CHAPTER IX.

WRITING.

Aims—Training in writing should have a threefold purpose, legibility, hygienic conditions and speed. To attain the first, two changes are essential, the adoption of vertical script consisting of the simplest possible letter-forms, because every unnecessary stroke, however insignificant in itself, tends to obscure the essential characters; and the general use of broad pens giving uniform strength to the strokes. (It were as reasonable to speak in a thin, weak voice as to write in fine hair lines.) The hygienic conditions depend upon the naturalness of the position and movement used, and upon the size and character of the writing produced. Speed is conditioned by the position and movement, the simplicity of the letter-forms and the kind of training given.

Position—The approved position of body, arm and hand is shown in Fig. 1. The body is self-supporting. The elbows are kept well back near the sides so that the weight of the forearm is mainly supported from the shoulder. To carry the forearms forward and spread them upon the desk disturbs the pose of body, and inevitably results in a decidedly stooping posture with a hunching of one shoulder and a lateral curving of the spine. The writing page should be in front of the body, with the writing line

FIG. 1.—Correct Position for Writing.

parallel to, and from three to ten inches from the edge of the desk.

The position of the body and arm determines the position of the hand, and hence the method of pen-

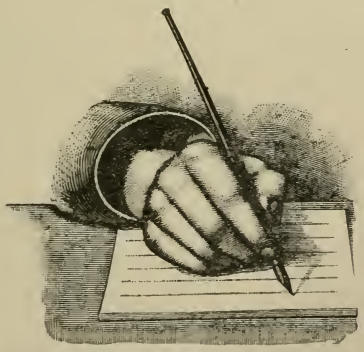


FIG. 2.—Right Method of Penholding.

holding. If the forearm be raised to the horizontal position while the elbow is kept near the side the

hand will naturally turn with the palm facing slightly inwards. See Fig. 2. That this is the most natural method of penholding is attested by the fact that little children instinctively adopt it, and almost every writer uses it no matter how long and carefully he may have been trained in the utterly wrong position shown in Fig. 3.

The pen should be held so that the end of the first finger will be at least 1½ inches from the point of the pen. The penholder should cross as near as possible the end of the second finger. If the pen be

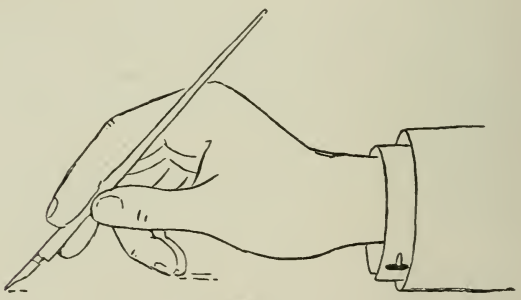


Fig. 3.—Wrong Method of Penholding.

held too near the point, or if the end of the second finger be allowed to drop below the handle the third and fourth fingers are likely to press upon the desk thus restricting the free action of the hand.

These directions for position and penholding are general and must not be applied rigidly to the individual pupil. Physical conditions and temperament to some extent determine the precise position that will be most natural for each.

On desks nearly flat or too high for the child the

paper may be moved a little to the right, and turned at a slight angle.

Movement—It is obvious that the position of body, arm and hand determines the kind of movement one can use most easily and effectively. With the position above described it is found that a *forward-and-back* movement of the hand and forearm at right angles to the writing line, and an unrestrained movement of the fingers for shaping the letters, are easy and natural. At first, and for a considerable time, the learner should be encouraged to write without resting the hand or arm upon the desk; as he gains confidence, power and skill, the arm should be allowed to touch the desk. Even at the later period it would be well for the pupil to practise for a few minutes at the beginning of each lesson with the hand and arm entirely free from the desk, but in doing this he should not raise the elbow.

Kinds of Writing—The direction and the general character of writing depend upon the movement used in producing it. Experience has demonstrated that the movements described produce the fundamental

Plate I.

forms shown in Plate I. At the left of the writing line the natural tendency will be to a backhand, and at the right to a forward slant, but in the middle of

the page the vertical will be found to be the normal direction for the great majority of writers. The essential character of the most natural style of

Plate II.

writing will be more clearly seen in Plate II. when contrasting it with that shown in Plate III. The upstrokes as well as the down are vertical, and the turns are full, corresponding with the ends of the ellipse. In Plate III, which represents a compromise

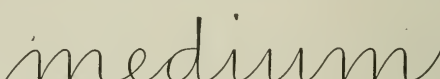


Plate III.

between slant writing and vertical, the upstrokes are slanting, necessitating a zig-zag movement which in rapid work, cannot be controlled for legibility, the m, n, i, and u forms becoming wholly indistinguishable.

Materials—Because the smaller nerves and muscles of the young child are not developed, the first writing should always be large. The materials for the first year's writing are desirable in the following order: 1. Blackboard and crayon; 2. Manilla paper and broad, soft pencils; 3. Good writing paper, broad, smooth pens and good black ink. A poor quality of paper and fine pens are bad, and slates cannot be too strongly condemned. The general use of fine pens in the schoolroom is probably a result of the influence of the conception of school

writing as a fine art, a mistake, even from the art point of view, for the best artists rarely, if ever, use fine pens.

Under the conditions that now exist in most schools it is probable that headline copy books, in conjunction with practice paper and the blackboard, give best results. The exclusive use of the blackboard and practice paper is objectionable from four points of view:

1. Few teachers are well qualified to place before their pupils from day to day the best models.

2. A copy upon the blackboard presents distorted letters to pupils not directly in front of it.

3. Much use of the blackboard by young children is very injurious to the eyes.

4. Pupils will not usually work with as much care upon ephemeral practice paper as upon a book which is a permanent record of progress.

Desks having a slope of about fifteen degrees are to be preferred. They tend to preserve erect posture, bring the paper into better position for vision, and favor freedom and power in both writing and drawing.

With What to Begin—The first lessons should involve copying only single words which the children have learned to read. The copy should be very large because:

1. Only large work is consistent with the child's condition of nervous and muscular development.

2. The forms and relations of letters are more accurately perceived.

3. Mistakes are more easily seen.

4. Large forms necessitate a freer movement.

There should be no guide lines but the single base line. It is true that during the first year or two children write with more precision upon specially ruled paper, and the product may appear better, but it must be remembered that the object is *training* rather than *writing product*, and guide lines deprive the child of the opportunity of judging the forms and proportions of the letters, and at the same time restrain freedom of movement. This is quite in accord with the most advanced thought regarding related studies, and carefully conducted experiments have shown that children trained without the special space-ruling soon gain more real power than those who are at once supported and hampered by the guide lines. In case a pupil's writing is very irregular it is better to let him space-rule a few lines after he has written them that he may see the irregularity.

The letter forms should be as simple as possible and as much like the print forms as is consistent with easy execution. This implies several radical changes in the old script alphabet, or rather, a new alphabet.

1. The adoption of the simple proportion of one to two for all letters and parts of letters.

2. The omission of many worse than useless initial and final strokes.

3. The substitution of simple curves or straight lines for the compound curves so difficult to learn and useless in practice.

4. The omission of many inconvenient joining lines.

The schools have perpetuated no more absurd

notion than that the writer must not lift his pen while writing a word. No one observes the law, not even those teachers who urge its necessity. The most rapid, legible writers ignore it most. The skip from the finishing stroke of one letter to the beginning of another relieves the nervous and muscular tension. All joinings detract from rather than add to legibility. Inconvenient joinings, usually upstrokes, retard speed. Much as insistence upon these joinings hinders the trained writer, it hampers the learner infinitely more both in seeing the essential form and in reproducing it. This is rank heresy to many teachers, but a little investigation will convince the most skeptical that it is a simple obvious truth.

Special Writing Lessons—These should always be brief, in primary classes from eight to ten minutes, to be gradually increased to about twenty minutes in the sixth year. This time should be devoted mainly to careful practice, but it should also include:

1. Training pupils in concentrated attention to the forms of letters and words, *i.e.*, in clear perception.

2. Correcting wrong tendencies in position, pen holding and movement, and common errors in form.

3. In advanced classes, practice in speed writing.

Ordinary Class Writing—While much depends upon the special lessons during the first five or six years vastly more depends upon how the ordinary written exercises are done. The teacher who does her own work neatly, and uniformly insists upon careful work from her pupils can scarcely fail to have a class of good writers.

Individuality—For class work there must be some standards of direction and form, but these should be regarded rather as models for the learner than as inflexible laws of handwriting. As the pupils approach the higher grades they should be allowed and encouraged to find the peculiar style of writing that is easy and natural for each, and beyond the sixth or seventh year writing from copies should be unnecessary. To insist upon conformity to any mechanical standard is to repress the development of the child's true self, his best character.

Speed in Writing—The possibility of developing one's greatest speed in writing is conditioned by:

1. The naturalness, ease and freedom of the whole posture.
2. The harmony of the movement with the position.
3. The harmony of the letter-forms with the movement.
4. The simplicity of the forms.
5. Freedom from the arbitrary law that all letters in a word must be joined.
6. The kind of training.

Having dealt with the first five points only training in rapidity remains to be considered. This must conform to the general law of training, *i.e.*, practice under favorable conditions. After pupils have been writing carefully three or four years, begin one minute speed tests on such simple words as, *an, and, the* or *can*. Insist that the writing shall be neat and plain, but give two or three one minute tests each day and have pupils note progress in speed. Sometimes give such tests upon a particular letter

that is difficult of execution. In higher grades give a whole sentence or even a stanza of poetry to be written as often as possible in one or two minutes. Besides giving speed this practice will be found the best training in movement, and to prevent degeneracy of the writing in the higher grades where rapidity becomes necessary.

Suggestions—1. In early training have pupils concentrate attention upon the word form, sometimes going through the movement of writing it in the air, then cover the copy and have them write it from memory.

2. Have the copybook copy practised on blank paper until a fair degree of accuracy is attained, then the book becomes more important as a register of the pupil's best work.

3. In going through the copybook the first time have only the first half of each page written, then the second written some weeks later, should show decided progress.

4. If, in omitting joining lines, pupils separate letters too far, point out that to make words, letters must be grouped as in print, and that writing is more legible if words are well separated.

5. There is no valid objection to a slight backhand and in some cases no amount of training will overcome it. With little children, however, it is often due to wrong position, to too high and flat desks, and to lack of control and freedom. Removal of the cause removes the result.

Taught my first lesson
Sept 22

Froebel first made to introduce
the unfolding & development
of the child mind. He gave
his life to the work.
Froebel = A Prussian.

Taught my first lesson Sept 15th
" " 13.
Taught my first lesson Sept 19th
" " 10.
second " Sept 26.